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ABSTRACT

This guide provides a resource for teachers interested in developing unified science instructional units, and is a guide to potential modules that can be assembled into instructional units with a minimum of materials, equipment, and time. All modules included were selected from documents abstracted in "Resources in Education (RIE)" and available through the Education Resources Information Center (ERIC) system. Module ideas are indexed via ERIC document number (ED number) under themes including: general concepts, process, phenomenon, problem, cause-effect, density, energy, evolution, force, perception, population, system, and others. An abstract of each module idea is then listed in order by ED number. Each abstract includes components, status, materials, mode, context, target, themes, and a brief description. (SL)

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The Ohio State University

SE 023 475

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GUIDE TO FUSE MODULES ABSTRACTED IN RIE - 1976

BY VICTOR SHOWALTER

FUSE CENTER FOR UNIFIED SCIENCE EDUCATION

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COLUMBUS, OHIO 43209

SEPTEMBER, 1977

This guide contains a special selection of documents that were abstracted in Research in Education during 1976. The documents were selected on the basis of their potential use in teacher developed unified science units using the modular approach advocated by the Federation for Unified Science Education. (FUSE)

INTRODUCTION

Purpose of this Guide

This guide is intended as a resource for those teachers interested in developing their own local unified science instructional units according to the procedures advocated by the Federation for Unified Science Education (FUSE). It is a guide to potential modules that can be assembled into instructional units with a minimum of materials, equipment, and time.

FUSE Modules

A FUSE modules is a more or less self-contained learning activity that can be used as part of a unified science unit. In practice, a group of modules would be selected on the basis of a unit organizing theme to fulfill specific learning objectives for the unit. A given module might be used in connection with several differnet unit organizing themes and/or to achieve different educational objectives in different school situations just as a given electronic module can be used in different electronic instruments. Guidelines for using modules to assemble instructional units in the FUSE style exist and are available as described in a later section.

RIE

Research in Education is a monthly publication of the Educational Resources Information Center (ERIC) and contains abstracts of important educational documents that have not been published in journals. Most of the documents abstracted in RIE are available in their full form on microfiche at a nominal charge. Thus it is possible to obtain the equivalent of a 400-page book for less than one dollar. Many, if not most; of the documents abstracts in RIE are in the public domain and therefore may be used by anyone provided proper source credit is given. Many of the entries in RIE are instructional materials developed by local schools and/or federally funded projects and these have the potential of being used as modules in units assembled using the FUSE approach.

Module Selection Criteria

The primary criterion used in selecting documents for inclusion in this guide was that of availability. To be considered for inclusion, a document had to be available on microfiche and had to be useable by teachers without worrying about infringement of copyrights.

The second criterion was adaptability. Each document to be considered for inclusion had to contain one or more self-contained learning activities for students that had promise of being used one or more of the four types of unified science theme types (concept, process, phenomenon, or problem).

The third criterion was feasibility. To be considered for inclusion in the guide, the activity or activities had to be practical for most school situations. Activities requiring expensive and/or hard-to-get materials or equipment were avoided.

The last criterion was uniqueness. In general an attempt was made to avoid inclusion of activities that have become standard in science books and programs during the past. This criterion also included a student interest dimension.

Although no deliberate effort was made to get a uniform distribution of activities across all grade levels, the entire K-]2 span is included. Many of the upper grade activities could also be used at the college level and with adults.

Using This Guide

The key to using this guide is the index which lists the unit organizing themes and the RIE document numbers relevant to each. Because of its importance the index appears on blue paper immediately following this introduction.

Each RIE document in this guide is described on a single page and oredred sequentially according to ED numbers which appear at the upper left of each page. The ED numbers are also used in ordering copies of the documents included.

In practice a teacher will probably look at the index with a particular theme in mind. The index will refer the teacher to one or more document abstracts. The teacher will locate each of these and decide on the basis of the information given whether or not to obtain the actual publication or a microfiche copy of it. To assist in this decision, the regular NIE descriptive abstract is given at the bottom of the page. In addition, a special abstract based on important factors in using the FUSE approach is given at the top of the page. The special abstract contains seven specific items: components, status, materials, mode, context, target, and themes. Each of these can be "translated" as follows:

components - the present form of the potentially useful material in this document and are described as "activities", "chapters", etc.

status -- an estimate of what needs to be done to the components to make them "classroom ready" in the FUSE model.

materials - a description of the nature of the materials and equipment required.

mode - a listing of the modes of learning utilized by one or more of the components - about 20 different modes are recognized and described elsewhere.

context - refers to the special or usual science disciplines associated with the components.

target - the grade level or grade range for which the components in their present state are probably appropriate.

themes - specific themes grouped according to types acknowledged in the FUSE approach:

a - concepts
b - processes
c - phenomena
d - problems

Obtaining Materials

Microfiche (MF) or paper copy (HC) of each entire document contained in this guide may be obtained from the ERIC Document Reproduction Service (EDRS) at the prices noted in the abstract. Order by ED number and title from : EDRS, PO Box 190, Arlington, Virginia 22210. Payment must be in advance and paid by check or money order. Postage charges must be included.

If microfiche is ordered, a special microfiche reader must be available since each fiche contains about 100 eight by eleven (8" X 11") pages on a single piece of plastic that is about four by six (4" X 6").

Often it is advisable and less expensive in comparison to paper copy, to order the original publication from the original publisher. Whenever a document is available this way, it is noted just below the EDRS price in the abstract.

Further Information on FUSE Approach

The following publications are available through ERIC and are abstracted in RIE:

Unified Science - Premises and Prospects, Showalter, V. and others
Federation for Unified Science Education, Columbus, 1975
107pp ED 116 916

Unified Science Education - Programs and Materials, Showalter, V.
Federation for Unified Science Education, Columbus, 1973
76 pp ED 077 772

The following articles can be found in most education libraries:

"FUSE" and the Center for Unified Science Education," Thomson, B.
Schools Science and Mathematics, January, 1975

"The Fuse Approach, "Showalter, V., The Science Teacher,February, 1973

The following documents can be obtained from The Center for Unified Science Education, 332 Renner Hall, Capital University, Columbus, Ohio 43209

What Is Unified Science Education? , Showalter, V. and others,
Federation for Unified Science Education, Columbus, 1977
40 pp $5.00

Unified Science - Premises and Prospects, Showalter, V. and others,
Federation for Unified Science Education, Columbus, 1975
107 pp $6.00

Personal consultation and assorted FUSE materials are available through each of the FUSE regional centers as well as the national center in Columbus. The directors and locations of the FUSE regional centers are:

- David Cox, FUSE Center at Portland, Box 22276,
  Milwaukie, OR 97222

- David Howell, FUSE Center at Massachussetts, Deerfield Academy, Deerfield, MA 01342

- Tom Gadsden, FUSE Center at Florida, P.K. Yonge Laboratory School, Gainesville, FL 32601

- Dick McLeod, FUSE Center at Michigan State, McDonel Hall, Michigan State University, East Lansing, MI 48823

- Al Gunter, FUSE Center at Shippensburg, Shippensburg State College, Shippensburg, PA 17257 (717) 532-9121

- Lou Casciato, FUSE Center at West Chester, West Chester State College, West Chester, PA 19380 (215) 436-2788

- Darrell Goar, FUSE Center at Moline, Moline Senior High School, Moline, IL 61265 (309) 762-9042

FEEDBACK FORM

Please take a few minutes to complete this form and return it to the Center for Unified Science Education. Your responses will be tabulated with others and the results used to evaluate the guide. Should the guide be sufficiently useful, there is a possibility that similar guides for other years may be produced.

1 - In general, how would you rate the usefulness of this guide in assembling unified science units? (Circle one number)

not useful at all		moderately useful		extremely useful
1	2	3	4	5

2 - Have you actually used this guide to design one or more unified science units? (Circle one) yes no

3 - Do you plan to use this guide in the near future to design one or more unified science units? (Circle one) yes no undecided

4 - Have you actually taught one or more unified science units within the past year? (Circle one) yes no

5 - Have you shared this guide with one or more other teachers? (Circle one) yes no

6 - Do you plan on sharing this guide with one or more other teachers in the near future? (Circle one) yes no undecided

7 - What suggestions do you have for improving this guide? (write response in space provided and continue on the back of page if necessary)

8 - What other comments do you have regarding this guide? (write response in space provided and continue on back of page if necessary)

- -

OPTIONAL

Name____

Position______________________________________

School_______________________________________

Address______________________________________

- -

Please mail to:

The Center for Unified Science Education
332 Renner Hall, Capital University
Columbus, Ohio 43209

8/9

CONCEPT THEMES

Index A

Cause-effect - ED120 348, ED125 868

Change - ED111 661, ED111 664, ED113 171, ED114 295, ED116 245, ED117 406, ED119 960, ED119 962, ED125 997, ED119 961, ED123 055, ED124 430, ED125 868

Cycle - ED118 400, ED119 949, ED119 960. ED120 348, ED123 055, ED124 457

Density - ED125 997, ED124 392

Energy - ED111 662, ED111 663, ED111 664, ED113 171, ED117 541, ED118 447, ED119 947, ED120 348, ED123 417, ED124 379, ED124 383, ED 124 387, ED124 409, ED125 868, ED125 885, ED125 996

Entropy -

Equilibrium - ED112 246, ED113 171, ED119 949, ED119 962, ED119 963, ED124 379

Evolution - ED111 625

Field - ED124 370, ED124 380

Force - ED111 623, ED111 661, ED117 406, ED118 447, ED124 374, ED124 379, ED124 380

Fundamental Entities - ED115 508, ED115 510

Gradient - ED124 373, ED125 868

Interaction - ED114 295, ED115 506, ED115 508, ED117 406, ED119 946, ED119 960, ED119 961, ED120 348, ED123 420

Invariance -

Model - ED111 609, ED111 623, ED111 661, ED113 171, ED115 508, ED115 510, ED115 511, ED116 946, ED118 428, ED118 447, ED125 997, ED124 370, ED124 377, ED124 378, ED124 380, ED124 382, ED124 384, ED124 385, ED124 389, ED124 390, ED124 409, ED124 453

Orderliness -

Organism - ED123 055

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Probability - ED127 134, ED116 941

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Defining Operationally -

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Formulating Models- ED115 511

Hypothesizing - ED111 999, ED113 154, ED115 504, ED116 245, ED 116 941, ED118 447, ED125 997, ED124 374

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Beach - ED119 962

Bicycles - ED121 950

Blood - ED123 420, ED123 421

City - ED116 946, ED119 963, ED124 453

Climate - ED124 373

Color - ED124 382

Diffusion - ED115 510

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Flight - ED124 374

Forests - ED116 946

Growth - ED119 946, ED119 963, ED119 948

Hair - ED118 430, ED120 348

Illusions - ED124 374

Insects - ED120 426

Life - ED124 430

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Energy Supply - ED111 662, ED111 663, ED111 664, ED114 268, ED117 503, ED119 949, ED124 387, ED124 426, ED125 885

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(see pollution - sound)
Pollution - ED113 171, ED117 541
Radioactive - ED115 468, ED120 348, ED124 389, ED124 409

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Radiation Safety - ED124 389, ED124 409 (see safety - radiation)

Radioactivity - ED115 468, ED120 348, ED124 389

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Reproducing Images - ED124 382

Resources Usage - ED118 400, ED119 946, ED119 947, ED119 948,(see natural resources)

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Safety - Boating - ED124 392

  Radiation - ED124 389, ED124 409 (see radiation safety)

Simulation - ED111 631

Solid Waste - ED114 268, ED116 914, ED119 946, ED119 947, ED119 949, ED119 960, ED119 961, ED119 963, ED125 868

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Water Pollution - (see pollution - water)

Water Supply - ED119 961, ED121 566, ED123 420, ED124 392, ED125 854, ED125 868

Weeds - ED120 426 (see pesticides)

ED 110 748

Gasior, A. G.
Agriculture for Little People
Rutgers University, New Brunswick
1975 79pp
New Jersey Vocational - Technical Curriculum Laboratory, Building 4103
Rutgers University, New Brunswick, N. J. 08903 $1.50 plus postage
EDRS price MF $0.83 HC $4.67 plus postage

Components - Short integrated units (8) consisting of suggestions for activities and topics grouped by science, mathematics, reading, physical education, etc. Assumption that all are teacher directed. Units include: "Visit to the Golf Course", "School Rake Up", etc. A few very general objectives are included.

Status - Each activity needs to be developed into a guide sheet..

Materials - Not specified but probably simple.

Mode - Environment, laboratory, reading

Context - Botany, zoology, (mathematics, reading, etc.)

Target - Intended for grades K - 3 but could be extended upward with proper guidesheets.

Themes - a -
b - classifying, measuring, observing
c -
d - food supply

Imagination used in identifying units with local resources. In addition to examples above there are: Stadium Visitations and Visit to and Apple Orchard.

This document is a collection of teacher guides to sample units introducing agriculture at the primary level; part or all of the units can be used along with the regular curriculum during the school year. Intended to acquaint K-3 students with agriculture's important role, the purpose of the course is to impart basic knowledge of materials, tools, processes, concepts, and career opportunities in agriculture. Five introductory units prepare students to focus on agriculture, the guide outlines are very brief. The nine sample units on agriculture are activity-based; the teacher guides are presented in the form of brief outlines in general terms, outlining basic procedures and listing content-area skills such as reading and mathematics which may be developed in the course of the activities. Four of the nine sample units are field-trips (to an orchard, a tomato farm, a golf course, and a stadium); four others involve the planting and maintenance of school gardens (flowers from bulbs, flowers from seeds, fruit in a greenhouse and vegetables); and the reamining sample unit teaches leaf collection and identification through a "school rake up". A teacher evaluation form, agribusiness career information, listed teaching resources, and 10 student activity sheets are included.

ED111 609

Savler, D. S. and J. C. Smith
Aerospace Environment
Aerospace Education I
Air Force Junior ROTC, Maxwell Air Force Base
1972 140pp
EDRS price MF$0.83 HC $7.35 plus postage

Components - This textbook consists of five chapters including "Earth and Atmosphere" and "From the Earth to the Moon". Diagrams and index.

Status - Ready for use.

Materials - None

Mode - Reading

Context - Astronomy, meteorology

Target - Grades 9-12

Themes - a - system, model
b - predicting
c - space, air, weather
d -

This book is one in the series on Aerospace Education I. It briefly reviews current knowledge of the universe, the earth and its life-supporting atmosphere, and the arrangement of celestial bodies in outer space and their physical characteristics. Chapter I includes a brief survey of the aerospace environment. Chapters 2 and 3 examine the composition of the earth's atmosphere, global weather patterns, and the role played by various forces in producing weather. Chapter 4 includes recent findings on the surface characteristics and features of the Moon. The final chapter contains a brief description of the instruments used by astronomers and examines the worlds of interplanetary, interstellar, and intergalactic space. The book is designed for use in the Air Force Junior ROTC program.

ED 111 623

Cox, R. V.
Air Navigation
Air Force Junior ROTC, Maxwell Air Force Base
1973 135pp
EDRS price MF $0.83 HC $7.35 plus postage

Components - This textbook is composed of seven chapters with reasonably good illustrations, although some have not reproduced well on microfiche. List of further readings. Index.

Status - Ready for use.

Materials - None

Mode - Reading, data bank

Context - General

Target - Grades 9-12

Themes - a - model, force, quantification
b - classifying, interpreting data
c -
d - finding one's way

This revised textbook, published for the Air Force ROTC program contains a discussion of basic and essential understandings about air navigation. The first part of the book describes maps, air navigation charts, flight planning, and pilotage preflight. Basic differences between ground maps and air charts are described and the methods of expressing position, direction, distance, and time are explained. The last three chapters include a description of different types of navigation instruments and aids used in flight.

ED 111 625

Callaway, R. O. and J. D. Elmer
Civil Aviation and Facilities
Air Force Junior ROTC, Maxwell Air Force Base
1973 129pp
EDRS price MF$0.83 HC $7.35 plus postage

Components - This textbook is composed of six chapters of approximately equal length. A few end-of-chapter suggestions for local speakers and reading research.

Status - Ready for use.

Materials - None

Mode - Reading, data book.

Context - Engineering, (history)

Target - Grades 9-12

Themes - a - evolution, system, quantification
b - interpreting data
c - airport
d - air traffic control, safety

This is a revised textbook for use in the Air Force ROTC training program. The main theme of the book is concerned with the kinds of civil aviation facilities and many intricacies involved in their use. The first chapter traces the development of civil aviation and the formation of organizations to control aviation systems. The second chapter describes varieties of aviation of which the term "general aviation" is used. This includes brief descriptions of agricultural, business, instructional, recreational, air taxi service.

Coard, E. A.
Human Requirements of Flight Aviation and Spaceflight
Aerospace Education III
Air Force Junior ROTC, Maxwell Air Force Base
1974 197pp
EDRS price MF $0.83 HC $10.03 plus postage

Components - This textbook is composed of six chapters on topics such as "Physiology of Flight" and "Surviving and Living in Space". List of further readings. Index.

Status - Ready for use.

Materials - None

Mode - Reading. Each chapter ends with a list of "things to Do" but they are usually based on outside reading. Some limited data bank material.

Context - Physiology, engineering, physics.

Target - Grades 9-12

Themes - a - system, perception
b - interpreting data
c - atmosphere, radiation
d - survival, radiation hazards, space flight, simulation, human fatigue.

This book, one in the series on Aerospace Education III, deals with the general nature of human physiology during space flights. Chapter I begins with a brief discussion of the nature of the atmosphere. Other topics examined in this chapter include respiration and circulation, principles and problems of vision, noise and vibration and self-imposed stresses. Chapter 2 provides an account of aerospace medicine. The next two chapters are devoted to a general description of protective equipment used by fliers, pilot training, and surviving and living in space. Chapters 5 and 6 provide information on skylab and future space flights. The book is designed to be used in the Air Force ROTC program.

ED 111 661

Abernathy, S.
Earth Science Unit for Second Grade: A Seed Crystal Approach
New Mexico State University, Las Cruces
1975 65pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - This unit contains suggestions for teacher-director discussions and demonstrations grouped in six sections of what amounts to a course syllabus. Typical sections are titled: "Forces Acting on the Earth's Surface" and "Fossils". The unit would require 12-18 weeks to cover in its entirety. Reading references made to contemporary elementary science texts.

Status - Many of the components could be converted into useable modules by writing appropriate guidesheets. This could be done to introduce more learner inquiry and hands-on activity.

Materials - Local rocks and standard geology materials.

Mode - Reading, discussion, demonstration.

Context - Geology, paleontology.

Target - Although intended for grade 2, grades 5-9 would be more appropriate in view of the abstract nature of some concepts introduced.

Themes - a - change, model, force
b - classifying
c - rocks, soils
d - erosion

This teacher's guide to a second-grade earth science unit provides a range of activities, suggestions for classroom discussion, and opne-ended questions suitable for each of the concepts developed. One of the central purposes of the unit is to develop independence and self confidence by encouraging the student to think through a problem clearly. The questions and activities give the student practice examining facts at hand and drawing logical conclusions in a nonthreatening atmosphere. For this reason, there are no tests at the end of each section. This is a seed crystal approach; its purpose is to begin building an accurate picture of the planet. Awareness, not mastery of concepts and terms, is the major objective. The first section of the unit, "Physical Nature of the Planet Earth," is conceptually oriented; the student learns facts about the problem. The second section, "Physical Nature of Rocks, Minerals, and Fossils", is more concerned with application; the student learns a skill which is used to solve a problem. Also included is a section about careers in geology and paleontology.

ED 111 662

Fowler, J.
Energy Environment Source Book
(USOE) National Science Teachers Association, Washington
1975 270pp
EDRS price MF. $0.83 HC $13.05 plus postage
National Science Teachers Association, 1742 Connecticut Ave., N.W.
Washington, DC 20009 $4.00 prepaid.

Components - Composed of chapters (7) appendixes (4) and an index that provide authoritative and up to date explanations and data relevant to the energy crisis.

Status - Classroom ready provided simple guidesheets are made available.

Materials - None

Mode - Reading, data bank.

Context - Physics, technology, economics, geology.

Target - Grades 10-12 plus although intended for teachers and reading level in some sections is rather high.

Themes - a - energy, system
b - measuring
c - earth
d - energy supply

This source book, one part of a three-part NSTA series on energy environment, is written for teachers who wish to incorporate material on the complex subject of energy into their teaching. This work is divided into two volumes, each with numerous tables and figures, along with appendices containing a glossary, mathematics primer, heat engine descriptions, and nuclear energy discussion. Volume I (Energy, Society, and the Environment) deals with energy and its relationship with conservation. In Volume 2 (Energy, Its Extraction, conversion, and Use), topics discussed include the rate of energy consumption, future sources of energy, and the increased cost of energy.

ED 111 663

Mervine, K. and R. Cawley
Energy Environment Materials Guide
(USOE) National Science Teachers Association, Washington
1975 68pp
EDRS price MF $0.83 HC 3.50 plus postage
National Science Teachers Association, 1742 Connecticut Ave. N. W.
Washington, DC 20009 $2.00 prepaid

Components - Composed of parts (4) appendixes (5) and an index.

Status - Does not contain modular material as such but does provide listings of many films, filmstrips, pamphlets, books and articles that could be used as modular materials.

Materials - Projectors

Mode - Reading, film, narrated slides, data bank, game, laboratory.

Context - Technology, physics, economics, geology

Target - Grades 2-12 plus

Themes - a - energy
b - measuring, predicting
c - petroleum
d - energy supply, water pollution, air pollution, land use.

This publication, one part of a three-part NSTA series on energy-environment, is a sampling of current energy literature. The references are divided into four separate categories, each directed for a specific audience: reading for teachers, readings for students (grades 8-10); Readings for students (grades 5-9) and readings for students (grades K-6). Included in four appendices are guides for films and audio-visual materials, curriculum materials, sources of information, and government documents.

ED 111 664

Energy Environment Mini-Unit Guide
(USOE) National Science Teachers Association, Washington
1975 217pp
EDRS price MF $0.83 HC $11.37 plus postage
National Science Teachers Association, 1742 Connecticut Ave., N.W.
Washington, DC 20009 $3.00 prepaid.

Components - Composed of miniunits (7) each of which is subdivided into lessons. Each lesson could form the basis of a module. Each miniunit ends with suggestions for evaluation.

Status - Learner guidesheets need to be made and some modification of procedures, etc. must be made to accomodate lessons to local situation.

Materials - Some lessons require standard high school science equipment.

Mode - Discussion, reading, demonstration, simulation, data bank, problem solving, laboratory.

Context - Technology, physics, chemistry, economics, (mathematics).

Target - Grades K-12. Two units are intended for K-3, four are for grades 5-8 and one is for grades 9-12.

Themes - a - energy, change
b - measuring, interpreting data, predicting
c -
d - energy supply, transportation, consumerism

This unit is one part of a three-part National Science Teachers Association series on energy-environment. The goal of the NSTA project is to create a collection of mini-units that provide materials for science and social studies teachers in grades K-12. These materials are intended to make teaching more interdisciplinary and to stimulate decision making in young children. Activities are sought that will enable students to: understand and use existing fundamental concepts in the energy-environment area; identify and evaluate personal and community practices, attitudes, and values related to energy-environment issues; and make effective decisions and/or define their views of appropriate actions on energy-environment issues.

ED 111 999

Wright, L. (director)
Problem Solving Activities
Wisconsin State Dept. of Public Instruction, Madison
1975 77pp
EDRS price MF$0.83 HC $4.67 plus postage

Components - Teacher directed exercises (17) each of which is self-contained. Originally intended for industrial education the problems involved are those of designing and building systems to meet specific needs. Index.

Status - A few exercises are in the form of explicit directions to students. Others are in the form of directions to teachers. All are based on problems that involve construction of a relatively simple device.

Materials - Most exercises require simple tools and materials to construct devices designed by students.

Mode - Laboratory, discussion.

Context - Physics, Engineering, general

Target - Grades 6-10

Themes - a -
b - measuring, hypothesizing
c -
d - land use, making useful things for people, transportation.

These "problems" include several original ideas and many will have high interest for local groups.

The teacher directed problem solving activities package contains 17 units: Future Community Depth, Let's Build an Elevator, Let's Construct a Catapult, Let's Design a Recreational Game, Let's Make a Hand Fishing Reel, Let's Make a Wall Hanging, Let's Make a Yo-Yo, Marooned in the Past, Metrication, Mousetrap Vehicles, The Multi System Encapsulator, Safety Card, Paper Airplane Contest, The Electro-Magnetic Crane, Egg Craft, Designing a Mobile, and Compressed Air Propulsion. Suggestions to the teacher regarding the statement of the problem to be presented, the point of view to be taken, procedures and needed materials, possible solutions to the problem, length of the project, safety notes, information for the student, and model drawings are provided where applicable. All activities pertain to field objective number 1 of the Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12.

ED 112 191

Rasmussen, C. and others
Eye and Ear Tools; An Instructional Unit
(USOE) Arizona Dept. of Education, Phoenix
1973 75pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - This unit contains seven "lessons" each which lasts from one to four 45-minute periods. Most activities are teacher directed.

Status - The present form is that of specific directions to teacher although some student worksheets are included.

Materials - Mainly simple easily obtained materials although a set of about 30 prepared microscope slides. An assortment of instruments including microscope, binoculars, and stethescope is recommended.

Mode - Discussion, demonstration

Context - Physiology, psychology (social studies, art)

Target - Grade 3 although could be used with slight changes up through grade 7.

Themes - a - perception
b - observing, measuring
c -
d - extending one's senses

The unit is designed to provide approximately 10 hours of insturction time for learners in grade 3. The primary intent of the unit is to help the learner develop an awareness of sound-extending and sight-extending tools. Four major goals and 18 performance objectives are addressed in the unit. The major topics included in the unit stress: 1)identification of selected sound and sight-extending tools; 2) determination of the function of sound and sight-extending tools; 3) identification of occupations which employ these tools;)4 determination of the value to the individual of observation, practice, and training; and 5) identification of safety hazards and rules in the use of these tools.

ED 112 246

Wise, J. and M. J. Iverson
Land Use - An Instructional Unit for Teachers of Adult Vocational Education in Agriculture
Kentucky University, Lexington
1973 160pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Worksheets, data tables, enrichment activities (demonstrations mainly), references, resource people grouped into 8 lessons (i.e. short units).

Status - Addressed to teachers but selections could be made from above and added to other activities to form modules for which guidesheets would need to be prepared.

Materials - Relatively common equipment and materials.

Mode - Data bank, environment, laboratory, interview.

Context - Chemistry, sociology, physics.

Target - Adult but also useful grades 10-12.

Themes - a - equilibrium
b - measuring
c - soil, water
d - land use

There is an assumption that material will be used by an instructor working with a total class and a large proportion of time devoted to lecture.

An adult farmer course designed to develop the effective ability of land holders to plan for and implement wise land use is presented. The unit consists of eight lesson plans: (1) the importance of land use, (2) the physical and chemical properties of the soil, (3) soil testing as a tool of land use, (4) balanced fertilization of soils, (5) selection of productive crop and/or livestock programs based on wise land use, (6) soil and water conservation, (7) soil and water management for rural use, and (8) soil water management for urban use. Masters for transparencies are included for each lesson. In addition, a teaching plan for the course and other planning forms are appended.

Activities, A Collection of Things to Do At the Environmental Learning Center
Isabella, MN
Environmental Learning Center, Isabella, MN
1975 119pp
EDRS MF $0.83 HC $6.01 plus postage

Components - Lessons and/or activities organized in eight groups: perception and communication (8), maps and areas (6), weather (4), snow (5), soil (2), aquatics (6), trees (8), animals (9). Lessons ran from one hour to four hours or more. No objectives.

Status - Most lessons are one or two pages. Each provides some background and specific procedural directions to teacher. Some lessons are accompanied by work sheets. It would be a relatively easy task to translate each lesson into a student guidesheet.

Materials - Relatively simple (thermometers, soil test kits, etc.) a list provided for each lesson.

Mode - Environment, laboratory, writing.

Context - Ecology, general, chemistry, botany, zoology, atmospherics, language arts, mathematics.

Target - Grades 7-12

Themes - a - population, perception, system
b - observing, measuring, inferring, classifying, hypothesizing
c - trees, snow, ponds, streams, soil
d - erosion, finding one's way

Although some of the lessons are specific to this environmental learning center, they are readily adaptable to other locations.

A collection of activities used successfully at the Environmental Learning Center in Isabella, Minnesota, are contained in this guide. Areas of study are perception and communication, mapping, weather, snow, soil, aquatics, trees, and animals. Within these areas is a number of related activities , each to be adapted to the appropriate grade level. The exercises contain a brief description with a statement of purpose. Equipment checklists indicate what the center furnishes, and what you are expected to provide. Procedures explain specifically how to go about each activity. A series of discussion questions serve as a follow up to the exercises. The lessons provide a degree of flexibility, so that they can be used when designing a resident program, or modified to accomdate individual or group needs. A number of the activities suggest the use of activity cards which can be reproduced from the lesson sample. Notebooks are also indicated as being inportant in most areas. Included in the appendix is a detailed account of available equipment at the center, including those items for camping, recreation, measuring, optics, astronomy, terrestrial needs, aquatic needs, test kits, and audiovisual aids. The bibliography contains a collection of materials used to develop environmentally oriented lessons.

ED 113 171

Chemistry: Experiments, Demonstrations and Other Activities Suggested for Chemistry.
New York State Education Dept., Albany
1975 378pp

EDRS price MF $0.83 HC $10.03 plus postage

Components - Contains an assortment of lecture notes, demonstration ideas, tables, graphs,etc. grouped in usual chemistry areas such as: "Solutions and Near Solutions", "Organic Chemistry", etc.

Status - Some lecture notes could be used as readings in present state. Demonstrations, etc. need to be translated into guidesheets.

Materials - Usual materials and apparatus associated with high school chemistry facilities. Some special apparatus such as civil defense radiological survey meter.

Mode - Demonstration, reading,lecture, data bank.

Context - Chemistry, physics

Target - Grades 10-12

Themes - a - model, energy, change, equilibrium
b - measuring
c -
d - Corrosion, pollution, radiation hazard

This publication is a handbook used in conjunction with the course of study in chemistry developed through the New York State Education Dept. and the University of the State of New York. It contains experiments, demonstrations and other activities for a chemistry course. Areas covered include the science of chemistry, the atomic structure of matter, solutions, metals and metallurgy, non-metals, ionization, acids, bases and salts, organic chemistry, nuclear energy, and reaction principles. Suggestions are included in the appendices relating to visual aids, planning field trips, preparing reports, suggested readings and facts related to equipment and supplies. General references and bibliographical data are included.

ED 113 193

Suggestions for Teaching Mathematics Using Laboratory Approaches Grade 1-6
Part 4. Measurment.
New York State Department of Education, Albany
1974 52pp

EDRS price MF $0.83 HC $3.50 plus postage

Components - Activities (113) for which a short procedure is addressed to teachers and coded to appropriate grade level. Activities grouped under: linear, area - volume - capacity, weight, time.

Status - Guidesheets need to be developed.

Materials - Simple and easily available.

Mode - Laboratory, demonstration, environment.

Context - General, astronomy, (mathematics).

Target - Grades 1-6 Each activity has a specified range of two or three grade levels.

Themes - a - time
b - measuring
c -
d -

This guide describes activities and materials which can be used in a mathematics laboratory approach to a basic mathematics program for grades 1-6. One-hundred thirteen activities pertaining to measurement concepts are described in terms of purpose, suggested grade levels, materials needed, and procedures. Some specific concepts included: linear measurement (33 activities), area and volume (31 activities), weight measurement (31 activities), time measurement (18 activities), estimation, inequalities, equalities, graphing, applications, similarity, non standard units, measure, counting surface area, weight, density, indirect area measure, cost calculations, conservation, recording data, problem solving, time continuum, directionality, shadows and time relationships. Most activities utilize the English system of measurement, but many can be adapted to the metric system. The guide concludes with a list of selected manipulative materials for mathematics laboratory use.

ED 114 268

Euston, C.
A Better Place to Be. A Guide to Environmental Learning in your Classroom
Department of Interior, Washington
1975 43pp
USGPO #240-00805 $1.25
EDRS price MF $0.83 HC $2.06 plus postage

Components - Groups of activities of various kinds each requiring up to one hour.

Status - Addressed to teachers in the form of brief general descriptions. Need to have details added and guidesheets developed.

Materials - Easily obtained materials

Mode - Environment, interview.

Context - Ecology, physics, chemistry and general

Target - Grades 4-8.

Themes - a - population, system
b -
c - trees
d - air pollution, water pollution, solid waste, noise pollution, land use, energy supply, nonrenewable resources.

This booklet designed for elementary teachers, contains ideas for involving students in firsthand experience with their environment and practical suggestions for preservation and improvement of their own homes and neighborhoods. The goals of this booklet are to increase environmental awareness and to help the students become responsible citizens. Among the topics discussed are: Environmental Problems and Activities; Environmental Learning and the Total Curriculum; School Site Development; Family Participation; Schoolwide Programs; and Awards and Recognition. A listing of environmental organizations, materials and sources, suggested readings and audiovisual aids concludes this booklet.

ED 114 289

Feldman, K. V. and others
Lessons Designed to Teach Fifth Grade Students the Concept of Tree at the Formal Level of attainment
NIE - University of Wisconsin, Madison
1975 73pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - Two lessons each of which requires approximately 30 - 40 minutes.

Status - Classroom ready.

Materials - Copies of lessons, pencils.

Mode - Programmed instruction.

Context - General

Target - Grade 5 but could probably be used up to grade 9 plus.

Themes - a -
b - classifying
c - tree, wood
d -

The autoinstructional activities included in this booklet were designed to be used to teach fifth-grade students the science concept "tree" at the formal level of attainment. The instructional strategies used in the lessons had been shown in previous studies to facilitate concept learning when used singly or in combination with one another. The strategies used are: (1) use of a definition, (2) empirical selection of concept examples through an instance probability analysis, (3) use of rational sets of examples and nonexamples, (4) pairing of examples with nonexamples, (5) emphasis of relevant attributes, (6) teaching of strategy, (7) immediate feed back, and (8) active involvement by the student. Instruction was divided into two parts, each part being a lesson. The first lesson presents the defining attributes and teaches children labels for defining attributes. The second lesson presents the definintion of "trees" presents a rational set of examples and nonexamples, and teaches a strategy for evaluating whether or not an instance is an example of the concept. Active involvement and immediate feed back are provided for the student in both lessons.

ED 114 295

Goolsby, C. M.
Laboratory Activities for Biology (student manual)
Institute for Services to Education, 2001 S. Street N. W. Washington
1972 223pp
EDRS price MF $0.83 HC $11.37 plus postage

Components - Laboratory exercises (43) each of which is related to one or more of eight standard biology units. Each contains several pages of learner instructions, learner response forms, and followup quiz. Some exercises require extended laboratory periods.

Status - Ready for classroom use provided an appropriate introduction relating activity to unit theme is presented.

Materials - Most exercises require standard laboratory equipment found in well equipped biology teaching laboratories.

Mode - Laboratory, (subsequent discussion implied).

Context - Biology, physics, chemistry.

Target - Introductory college level but could be used with high ability grade 10.

Themes - a - population, system, change, interaction
b - classifying
c - water
d - survival

Reproduction of any part requires permission from developer although there is no charge.

Intended to be used along with the "Teacher's Guide to Classroom Discussions for Biology"and the"Teachers Guide to Laboratory Activities for Biology",this volume presents 43 laboratory exercises for introductory college-level biology.

ED 115 468

Radiological Defense Textbook
Defense Civil Preparedness Agency of the Dept. of Defense, Washington
1974 201pp
EDRS price MF $0.83 HC $11.37 plus postage

Components - Chapters (14) with titles such as: "Basic Concepts of Nuclear Science", "Nuclear Radiation Measurement", "Effects of Nuclear Radiation Exposure", etc.

Status - Sections can be used "as is" for alternative reading modules. Student guidesheet needed.

Materials - None

Mode - Reading

Context - Nuclear science, physics, chemistry, physiology.

Target - Reading level is relatively high (grade 10 and up) and some sections require grade 12 mathematics.

Themes - a -
b - predicting, measuring
c -
d - nuclear fallout, nuclear radiation, radioactive pollution

This textbook has been prepared under the direction of the Defense Civil Preparedness Agency (DCPA) Staff College for use as a student reference manual in radiological defense (RADEF) courses. It provides much of the basic technical information necessary for a proper understanding of radiological defense and summarizes RADEF planning and expected operations. This textbook is not intended to provide RADEF operational procedures or direction for the development of RADEF plans and organizations. Such guidance will be found in other DCPA publications. Among the chapters are: (1) an Introduction; (2) Basic Concepts of Nuclear Science; (3) Effects of Nuclear Weapons; (4) Nuclear Radiation Measurements; and (5) Radiological Monitoring Operations and Techniques.

Hampton, C. H. and C. D. Hampton
Living Organisms for the Elementary Classroom
East Carolina University, Greenville
1975 21pp
EDRS price MF $0.83 HC $1.67 plus postage

Components - Technique descriptions (9) for culturing: guppies, acquatic plants, land snakes, algae (chlamydononas), daphnia, isopods (pill bugs), crickets, mealworm beetles, fruit flies, and wingless pea aphids.

Status - Addressed to teachers but could be adapted as low as grade 9 to make introductory or ongoing modules if guidesheets prepared. Problems or quotations to investigate are needed.

Materials - Relatively simple (jars, boxes, plastic bottles) listed on one page.

Mode - Laboratory, demonstration

Context - Ecology, botany, zoology.

Target - Grade 9.

Themes - a - systems
b -
c -
d - survival

This publication was prepared for elementray teachers and other local personnel responsible for providing, maintaining and using living organisms to enhance elementary science programs. The manual contains a foreward, general information, and an appendix. It gives information concerning equipment and supplies, establishing and maintaining and aquarium, and culturing techniques. Techniques are given for culturing the following organisms; guppies and aquatic plants, land snails, chlamydomonas, daphnia, isopods, crickets, mealworm beetles, fruit flies, and wingless pea aphids. The techniques have been researched and developed in the Life Science Center of Department of Science Education at East Carolina University and have tried by preservice elementary teachers taking courses in science education.

ED 115 504

Cumming, W. and others
Nature of Physical Science: Student Workbook
(NIE) Institute for Service to Education, Washington
1971 80pp
EDRS price MF $0.83 HC $ 4.67 plus postage

Components - Composed of chapters (6) and appendixes (4). Three of the latter are reprinted from other relevant publications.

Status - Most sections are ready for classroom use although guidesheets will be needed to relate to specific themes.

Materials - Some simple materials such as a rock collection and some handmade cardboard cutouts.

Mode - Reading, laboratory

Context - General, physics, (mathematics)

Target - Grades 10-12 although originally intended for college freshmen

Themes - a -
b - measuring, interpreting data, hypothesizing, experimenting

c -
d -

Although no specific objectives are included, this is aimed at developing learner's understanding of the nature of science in generating new knowledge.

This booklet is a student manual is a series of booklets that make up the core of a Physical Science course designed for the freshman year of college and used by teachers in the 27 colleges participating in the Thirteen College Curriculum Program. This program is a curriculum revision project in support of 13 predominately Negro colleges, and reflects educational research in the area of disadvantaged youth. In this unit, the scientific method is discussed and illustrated with simple experiments that show how scientist acquire knowledge. Examples and experiments are provided to show how scientists use mathematics in discovering relationships in the physical world. Patterns in physical problems are demonstrated in a discussion of the simple pendulum and the simple lever.

ED 115 506

Booker E. and others
Chemistry - Part I - Student Workbook
(NIE) Institute for Services to Education, Washington
1971 66pp
EDRS price MF $0.83 HC 3.50 plus postage

Components - Composed of sections (5) which include a few hands-on activities (3) and which are addressed to teachers.

Status - Most everything needs to be readdressed to students

Materials - Some simple materials need to be prepared for the activities, all of which use the same equipment.

Mode - Reading, laboratory, problem solving, simulation

Context - Chemistry

Target - Grades 11-12 although originally intended for college freshmen

Themes - a - interaction
b - interpreting data
c -
d -

The simulation involves a "chemical compound detector" that uses weighted packets and a simple two-pan balance.

This booklet is a student manual in a series of booklets that make up the core of a Physical Science course designed for the freshman year of college and used by teachers in the 27 colleges participating in the Thirteen College Curriculum Program. This program is a curriculum revision project in support of 13 predominantly Negro colleges and reflects educational research in the area of disadvantaged youth. This unit covers the fundamental principles of chemistry, including distinguishing features of four chemical classes of elements. Experiments are provided to illustrate the major concepts of chemical combination.

Booker, E and others
Chemistry - Part III
(NIE) Institute for Services to Education, Washington
1971 73pp
EDRS price $0.83 MF HC $3.50 plus postage

Components - Composed of three chapters, "The Chemical Bond", "The Patterns of Organic Chemistry", and "The Role of the Chemical Bond in Determining Chemical Properties"

Status - Essentially classroom ready although guidesheets needed to focus on specific unit themes.

Materials - Simple laboratory equipment plus some homemade cards for the game that is included.

Mode - Reading, laboratory (2) game (1)

Context - Chemistry

Target - Grades 11-12 although originally intended for college freshmen

Themes - a - model, interaction
b -
c -
d -

The "experiments" are rather simple and have preconceived results.

This booklet is a student manual in a series of booklets that make up the core of a Physical Science course designed for the freshman year of college and used by teachers in the 27 colleges participating in the Thirteen College curriculum Program. This program is a curriculum revision project in support of 13 predonimantly Negro colleges and reflects educational research in the area of disadvantaged youth. This unit covers the fundamental of organic chemistry, beginning with a discussion of ionic and covalent bonding. Exercises using molecular models are used to illustrate the geometry of basic organic molecules and the structural similarities of organic compounds in the same chemical classes. The kinds of bonds in a given molecule are related to chemical properties and chemical activity. A card game which reveals some important rules or organic chemistry is utilized. Experiments are also provided for some of the major concepts.

ED 115 510

Daniel, A. and others
The Gas Laws and the Kinetic Theory
(NIE) Institute for Service to Education, Washington
1971 88pp
EDRS price MF $0.83 HC $4.67 plus postage

Components - Contains a series of lecture and demonstration notes for teachers although these could be used as reading material for learners.

Status - Learner guidesheets need to be developed. Some demonstrations could be made into inquiry labs.

Materials - Usual physics laboratory apparatus.

Mode - Lecture, demonstration, reading.

Context - Physics

Target - Freshmen in college although could be used in grades 11-12.

Themes - a - model
b - interpreting data
c - diffusion, air
d -

Most of the activities are standard in traditional physics courses.

This booklet is both a teacher's manual and a student't manual in a series of booklets that make up the core of a Physical Science course designed for the freshman year of college and used by teachers in the 27 colleges participating in the Thirteen College Curriculum Program. This program is a curriculum revision project in support of 13 predominantly Negro colleges and reflects educational research in the area of disadvantaged youth. This unit investigates the behavior of gases using the gas laws as an example of empirical relationships and the kinetic theory as an example of a microscopic model. Experiments are provided to illustrate the major concepts.

George, A. and L. Ragland
Light: Teacher's Curriculum Guide for the Thirteen College Curriculum Program
(NIE) Institute for Services to Education, Inc., Washington
1971 81pp
EDRS price MF $0.83 HC $4.67 plus postage

Components - Chapters (4) in a text with some diagrams, demonstrations, and problem exercises. Chapter topics: "Historical View (of light) ", "A Closer Look at Waves and Particles", "Geometrical Optics", "Physical Optics".

Status - Could be used in present state as alternative modules if guidesheets prepared.

Materials - None except for a few demonstrations which require simple standard physics material.

Mode - Reading

Context - Physics, chemistry

Target - Although intended for college freshmen, could be used at grade 10 or 11.

Themes - a - model
b -
c - light
d -

These demonstrations and activites tend to be standard in conventional physics texts.

This booklet is a teacher's manual is a series of booklets that make up the core of a Physical Science course designed for the freshman year of college and used teachers in the 27 colleges participating in the Thirteen College Curriculum Program. This program is a curriculum revision project in support of 13 predominantly Negro colleges and reflects educational research in the area of disadvantaged youth. This unit approaches the topic of light by reviewing historical theories of light and waves and wave-particle duality. Geometrical optics is discussed in terms of reflection, refraction, and instruments which utilize light, such as the camera and the microscope. Physical optics is discussed in terms of color, interference, and diffraction. Experiments are provided to illustrate the major concepts.

ED 116 245

Jackson, J. and others
A Handbook for Using the Newspaper in the Classroom
Rocky Mountain News, Denver
1975 91pp
EDRS price MF $0.83 HC $4.67 plus postage

Components - Contains suggestions for activities using the daily newspaper in many subject areas (25 for science).

Status - Specific student directions and guidesheets need to be developed for each activity.

Materials - Daily newspaper.

Mode - Reading, data bank

Context - General, geology, ecology, etc.

Target - Grades 5-12.

Themes - a - population, perception, change
b - classifying, interpreting data, hypothesizing, predicting, communicating.
c - water,weather
d - land use, technological impact, health, air pollution, water pollution, human resources, natural resources.

It is difficult to overestimate the value of these activities since the newspaper is one of the few continuing sources of science information available to people throughout their lives.

This book is a guide to using the newspaper as an instructional tool in the classroom. The objectives are to help students become informed about and interested in what is happening in the world; to learn to read the newspaper intelligently; to help students realize the impact of newspapers on the public; to develop within the students a lasting interest in the reading of newspapers; and to increase and strengthen the skills acquired in other subject areas especially those in the language arts and social studies. The handbook includes information about how the newspaper is constructed, the function of different newspaper sections, newspaper terminology, propaganda and the newspaper, news reports, editorials, sports, comics, freedom of the press, and the history of the "Rocky Mountain News". Also included are various activities for social studies, language arts, non-readers and beginning readers, science, math, foreign language, and art.

ED 116 904

Hoke, J.
Minature Environments. On Environmental Education Guidebook.
U. S. Department of Interior, Washington
1974 32pp
USGPO, #4216-00069, $0.80
EDRS price MF $.083 HC $2.06 plus postage

Components - Directions for constructing five different types of microenvironment "containers",: warm climate plants, warm climate animals, anoles, dome, indoor turtle pond, outdoor turtle pond.

Status - Each set of directions is readable for grade 9 and up. Could be used with little modification as introductory, ongoing, or generalizing modules.

Materials - Some specialized but simple material and ordinary tools.

Mode - Laboratory, environment, demonstration.

Context - Botany, zoology, engineering.

Target - Grade 8 plus.

Themes - a - systems
b -
c - turtles
d - survival

The purpose of this booklet is to bring into the classroom the ecological processes and principles that underlie nature. Students get the opportunity to work with natural objects and to learn about the principles that regulate them. In this revised edition, a number of publications have been compiled and printed under one title. The booklet is designed to help the teacher by supplementing existing programs with these student-oriented activities. The information includes simple directions on how to build a number of different terrestrial and aquatic microenvironments, as well as the ecological principles behind their construction and maintenance. All materials are common and easily purchased, including the contents of the terrariums and turtle ponds. There are a number of diagrams and photographs to illustrate the procedures and principles being discussed.

ED 116 914

Environmental Education Teaching Resources: Projects for Environmental
Problem Solving.
National Education Association, Washington
1975 23pp

EDRS price MF $0.83 HC $ 1.67 plus postage

Components - Contains suggestions for local projects dealing with environmental problems along with ideas for how these projects could be developed. Contains a set of questions useful in formulating environmental impact statements.

Status - Provides only ideas. These need to be developed in detail and guidesheets prepared.

Materials - Variable but would utilize whatever is available.

Mode - Environment, laboratory, reading, interview.

Context - Multiple.

Target - Grades 5-12

Themes - a -
b -
c -
d - technological impact, air pollution, water pollution, solid waste, land use.

This publication is a guide for the design of student projects in environmental education. A few advantages of proble-focused projects are: easy incorporation into the ongoing curriculum; opportunity for joint student/teacher use of knowledge, information and skills in action-oriented activities related to local environmental concerns; identifying, weighing, and clarifying values; research and technical reporting skills; and development of divergent and convergent thinking skills. The student project provides a method for dtudent involvement and inquiry-based learning. The five instructional objectives presented are based on the above-mentioned advantages. Under each objective are teaching strategies, specific instructional procedures and some sample questions to raise. The objectives strategies, and procedures serve as the basis for process activities and outcomes that can be realized through all problem-solving projects. Three projects that can be utilized and adapted by secondary and college students in their study of communication on environmental issues are outlined. Two of the projects concern environmental impact; the third, environmental research. Each project is sub-divided into objectives, focus, suggested approaches, project design, and evaluation. Appendiced information pertaining to organizations of environmental concern, expanded problems for study, and a bibliography of materials is to be used in conjunction with the projects.

ED 116 941

Martin, P. (editor)
Suggestions for Teaching Mathematics Using Laboratory Approaches
New York State Education Department, Albany
1975 30pp
EDRS price MF - $0.83 HC - $2.06 plus postage

Components - Exercises (20) each of which is essentially self-contained.

Status - Specific sets of directions for each exercise but need to be translated into student guide sheets.

Materials - Simple materials required.

Mode - Laboratory

Context - General contexts.

Target - Grade 6 but usable up to 10 plus.

Themes - a - population, probability
b - interpreting data, predicting, hypothesizing, measuring, experimenting
c -
d -

These exercises were produced originally to develop probability concepts. Most can be done independently.

This guide is the sixth in a series of publications to assist teachers in using a laboratory approach to mathematics. Twenty activities on probability and statistics for the elementary grades are described in terms of purpose, materials needed, and procedures to be used. Objectives of these activities include basic probability concepts; gathering, tabulating, and interpreting data, making predictions; pattern discovery, formulating hypotheses; and fractions, rations and basic statistical procedures. The publication includes diagrams, charts, illustrations, and suggested questions to assist the teacher in operating an informal laboratory.

ED 116 946

Ring, N. (ed.)
Landscapes of Vermont. A Curriculum Guide in Land Use Education
(USOE) Dept. of Geography, Vermont University, Burlington
1975 47pp
Geography Dept. Vermont University, 112 Old Hill, Burlington, Vt.
05401 $1.00
EDRS price $0.83 HC $2.06 plus postage

Components - Contains chapters (6) on various aspects of land use. A few would be useful directly with learners. Other are addressed purely to teachers. Provides sources for other activities.

Status - Some material would need to be adapted to the local area. Guidesheets needed although some of the reading material is classroom ready.

Materials - Some activities require specialized maps and aerial photos.

Mode - Reading, problem solving, discussion, laboratory.

Context - Geography

Target - Grades 9-12

Themes - a - model
b -
c - forests, city
d - land use, using natural resources

This manual is designed to assist schools and organizations in gaining a better understanding of land use at the community, state, and national levels. The manual emphasizes interpretation of maps and photo-imagery to analyze the geographic concepts relating to landscape. The manual promotes the use of local government piblications from the U. S. Geological Suvery, the U. S. Soil Conservation Service, and state extension services, and the use of space photographs and satellite imagery. The manual lists projects and activities for land use study in social studies, science, vocational agriculture, humanities, environmental education, and 4-H groups. Thorough lists of documentary materials audiovisual aids, and other resources are included.

ED 117 406

Vocational Agriculture 4 - A Curriculum Guide
Oklahoma State Dept. of Vocational and Technical Education, Stillwater
1974 691pp
EDRS price $0.83 MF HC $36.83 plus postage

Components - Four major sections, two of which deal with "Plant and Soil Science" and "Agricultural Mechanics". Each section includes "information sheets" and how-to-do-it directions.

Status - Many activities include usable forms for "task sheets" although more complete "guidesheets" will be needed in all cases. Also there will need to be some adaptations for different states. Some hands-on laboratory activities could be derived.

Materials - Reading material only plus whatever equipment used for illustration and activities.

Mode - Reading, data bank, problem solving, geology, technology

Context - Chemistry, general geology, geography

Target - Grades 11-12

Themes - a - force, change, interaction
b -
c - soil
d - land use, corrosion

The curriculum guide for Vocational Agriculture 4 (Grade 12) contains 27 color-coded units of instruction organized into four sections; farm business management, leadership and careers, plant and soil science, and agricultural mechanics. The instructional units are designed to account for 60% of an instructor's time, the remaining 40% is left to the individual instructor to use with reference to the needs of the local community. For each unit the guide provides; objectives, both terminal covering the unit's subject matter and specific covering student performance expectations (on white paper); suggested activities fashioned around the specific objectives (on white paper); information sheets containing essential facts necessary for teaching the unit (on green paper); assignment sheets focusing on written skills (on brown paper) with answer sheets (on pink paper); job sheets providing necessary instructions for completing a production job (on blue paper) transparency masters of appropriate charts pictures or illustrations (on white paper); and tests for measuring students; accomplishment of specific objectives (on yellow paper) with answer sheets (on pink paper).

ED 117 503

Bahr, G.
A to Z Teaching Activities for Consumer Education

1975 38pp
EDRS price MF $0.83 HC $2.06 plus postage

Component - Activities ( ) most of which are self-contained.

Status - Suggestions to teacher for student acitvities which need to have details added and student guidesheets prepared.

Materials - Simple materials used many of which are obtained by students.

Mode - Interview, programmed instruction, environment, laboratory, discussion.

Context - General contexts with some sociology, physiology, psychology.

Target - Grades 6-12.

Themes - a -
b -
c -
d - consumerism, energy supply

Most of these activities are intended for simultaneous doing by a total class.

One work was selected for each letter of the alphabet and used to develop a learning activity for teaching consumer education at the high school level. In addition to the work on which the acitvity is based, other words for each letter are listed which may suggest activities. Ten of the sheets are designed to be duplicated for student use. The others contain specific suggestions directed to teachers for classroom activities or improvement and enrichment of instruction. The activities and suggestions include a side range of subject areas and skills such as language arts, mathematics, and social studies. Most of the activities are described in one-page presentations; the section on the letter "R", however is an 11-page presentation on resource units illustrating different kinds of units through three sample topics energy, auto repair and inflation.

ED 117 514

Consumer Education
Nevada State Dept. of Education, Carson City
1971 202pp
EDRS price MF $0.83 HC $11.37 plus postage

Components - Composed of short "units" (12) of about one week duration. Each "unit" includes a list of "concepts","learning activities" , and "resources".

Status - Since these are addressed to teachers, learner guidesheets must be prepared.

Materials - Reading matter only

Mode - Reading, discussion, survey, slides, report preparation, simulation

Context - General, technology, (social studies)

Target - Grades 7-10

Themes - a -
b - controlling variables
c -
d - consumerism, decision making

The curriculum guide is intended as a source to help teachers plan consumer education classes in Nevada, from junior high school through the adult level. Developed for a semester (18 weeks) separate course of study, using individual or group instruction, the guide may be expanded to meet the needs of a full year. Each unit can be taught as an individual course or integrated within other courses. Some sample lesson plans developed by teachers involved in the pilot testing are included. Unit outlines present overall objectives, concepts, learning activities, and resources, and include: consumer in our society; consumer decision making, with sample lesson plan; family transportation, with sample lesson plan; health care and services ; buying protection, with sample lesson plan; savings and investments; consumer protection, with sample lesson plan; a home for your family; furnishing and equipment for the home; and leisure time and recreation. The extensinve resource list included; books; government and organizational publications, including visuals; periodicals mailing lists; organizations providing current consumer information; and local, State and Federal agencies.

ED 117 541

Spitze, H. and others
Teaching Aids for Consumer and Homemaking Program
University of Illinois, Urbana
1972 153pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Contains a mixture of consumer based games and activities (13) and assorted readings for students at about fourth grade level. Most are in the form of directions to teachers. Bibliography and listing of sets.

Status - Readings are classroom ready. Games require preparation of special materials and guide sheets. Activities require guidesheets.

Materials - Generally simple materials but occasionally special equipment such as a camera.

Mode - Game, discussion.

Context - General, economics, sociology (social studies)

Target - Grades 5-9

Themes - a - energy
b -
c -
d - consumerism, pollution

The volume contains instructional materials for high school consumer education classes. The materials were produced at a workshop and were designed to introduce excitement and enjoyment in the learning process and to serve the slow reader. The first section contains an introduction to simulations and games in consumer education and descriptions of teaching techniques developed in the workshop. The second section begins with a statement of consumer education and the literacy Problem and continues with a 191-item annotated bibliography (with subject index) of low reading level materials. The annotations include grade level, cost, length, source, and comments about contents. The remainder of the volume provides examples of low reading level materials with suggestions for classroom use, produced by teachers in the workshop. The selections include stories, skits, essays, letters, poetry, and textbook style prose. The authors tried to make the writing concrete and personal, adult in interest but simple in sentence structure and vocabulary at the third to fifth grade reading level. Participants at the workshop are listed and their names also accompany their contributions throughout the volume.

ED 118 342

Vitale, J.
Outdoor Education Guide-Handbook
Waukesa (Wisconsin) Public Schools
1975 80pp
EDRS $0.83 MF HC $4.67 plus postage

Components - A series of activities using outdoor resources and addressed to teacher along with a few worksheets for students.

Status - Much is classroom ready although guidesheets needed for specific themes.

Materials - Usual outdoor equipment, one or two Lab-Aids kits, microscope.

Mode - Reading, laboratory, environment, slides, discussion.

Context - Botany, chemistry, zoology geography, (Mathematics)

Target - Grades 6-10

Themes - a - perception, population
b - measuring, observing, interpreting data
c - trees, wind
d - finding ones way, air pollution, water pollution

Designed by the Waukesha Public Schools (Wisconsin) specifically for an elementary level three-day camping trip at Camp Phantom Lake, this outdoor education guide presents some activities which suggest adaption. Activity directions, plans, worksheets, evaluation sheets, and illustrations are presented in sequential order for the following disciplines which, by design, frequently overlap; (1) Mathematics (acttivities involving measurement of height, distance, hills, triangles) ; (2) Social Studies (activities involving map and compass skills via use of a compass trail) (3) Science (scientific observation using a micro trail approach, observation tools, and sensory skills); (4) Language Arts (an activity Progressing from meditation to creative writing including discussions, sketching, water color painting, pantomiming, and poetry); (5) Physical Education (frisbee toss, run and summersault, relay, endurance race, football throw, leap frog, kickball and tug of war). Indicative of the variety of activities presented are (1) a candlelight ceremony designed to offer students opportunity to express a "gut" feeling to the gorup; (2) a section on water pollution testing (chemical analysis, filmstrip, and questions); (3) a guide to making a "friendship stick" (emphasis on symbolic significance). Also included are a 46-item awareness test and the necessary school forms for such an outing.

ED 118 400

Recycling Technology: Can It Be Taught?
1974 20pp
EDRS price $0.83 MF HC $1.67 plus postage

Components - An essay containing a good outline of the technical and ecnomical considerations associated with recycling of various materials. Also a list of specific reports written by students.

Status - Can be used as a source of ideas for modules as well as for designing a whole unit. Guidesheets needed.

Materials - Library

Mode - Report writing, survey

Context - Technology, economics, chemistry, physics

Target - Although intended for college level could be used at grades 10-12 with appropriate objectives.

Themes - a - cycle
b - interpreting data
c -
d - recycling, materials conservation, resources usage, technological impact

This paper describes the content of a seminar-type engineering course dealing with materials reutilization (recycling). The course, consisting of lecture and discussion by various faculty and outside experts as well as student presentations of research papers on recycling topics, is intended to investigate current areas in which recycling of materials appears feasible. Subjects chosen to be investigated are examined as to the chemistry and physics involved in the recycling process, through a materials science and process engineering viewpoint, and concerning the economics of the situation. It is indicated that this slight modification of the curriculum in metallurgy to recognize future concerns in the area of materials reutilization will allay the need for entirely new programs to deal with the problem.

ED 118 428

Social Studies Resource Supplemental to the Consumer Education
Curriculum Guide for Ohio
Ohio State Dept. of Education, Columbus
1971 103pp
EDRS price MF $0.83 HC $6.01 plus postage

Components - Contains a listing of activities some of which involve processes of science. Also contains "student handouts" which are short reading texts.

Status - Guidesheets needed although many of the activities are essentially classroom ready.

Materials - Library, reading selections, some easily prepared worksheets.

Mode - Reading, discussion, environment, simulation.

Context - Sociology, psychology (social studies)

Target - Grades 8-12

Themes - a - model, system, perception
b - inferring, interpreting data
c -
d - consumerism, technological impact, decision making, addiction

The active involvement of students in a study of the customs, traditions and institutionalized way society has organized to preserve economic stability is the goal of this consumer education teaching guide Designed for the use of social studies teachers, units are devoted to the studies of : (1) the economic system; (2) income procurement; (3) consumer behavior determinants; (4) consumer alternatives; (5) roles, rights and responsibilities; and (6) community resources. For each unit, specific topics, objectives, student activities, and resource materials are suggested.

ED 118 430

Kowalski, S.
Consumer Education in the Science Curriculum
New Jersey State Dept. of Education, Trenton
1972 30pp
EDRS price MF $0.83 HC $2.06 plus postage

Components - Contains a generalized outline of science related consumer education unit with several specific suggestions for kinds of activities. One specific unit, "Shampoos" is outlined with some specific tests and reporting form.

Status - Additional modules needed to make "Shampoo" unit complete. Guide-sheets needed. Almost total development required for other units following the model given.

Materials - Standard laboratory equipment

Mode - Laboratory, discussion, problem solving

Context - Chemistry, physics, technology

Target - Grades 8-12

Themes - a -
b - interpreting data
c - hair, shampoo
d - consumerism, rating consumer products

In this monograph, the implementation of consumer education topics into the science curriculum of secondary schools is advocated. Not only is the need for such activities explained, but several suggested instructional topics are provided. One area of recommended study is that of product comparison. A model outline of operation is provided, along with an example involving comparisons of shampoos.

Products Liability - Engineering and the Law
University of Wisconsin, Madison
1975   14pp
EDRS price MF $0.83 HC $1.67 plus postage

Components - An essay dealing with the problem of legal responsibilities of manufacturers, etc. who produce goods for public use.

Status - a Guidesheet needed to relate to unit theme.

Materials - None

Mode - Reading

Context - Technology (social studies)

Target - Grades 9-12

Themes - a -
b -
c -
d - technological impact

The fundamentals of products liability law are provided to aid the engineer and engineering student in the design and manufacture of products that are not only safe but also in harmony with the demands of the law.

ED 118 447

Hirschhorn, J. and others
Classroom Demonstrations in Materials Sciences/Engineering
University of Wisconsin, Madison
1975   11pp
EDRS price $0.83 MF   HC $1.67 plus postage

Components - A series of brief descriptions of emonstrations dealing with physical properties of various materials.

Status - Each could be worked up into an open-ended laboratory or expanded into a demonstration activity from the suggestions given. Guidesheets needed.

Materials - Simple materials plus standard physics apparatus. Atomic and molecular models.

Mode - Demonstration discussion (laboratory could be developed)

Context - Technology, physics, chemistry

Target - Grades 7-12

Themes - a - force, model, energy
b - measuring, hypothesizing, interpreting data
c - metals, light
d - appropriate materials, corrosion

Contains an extremely useful demonstration on the effects of heat treating steel (ie a paper clip)

Examples are given of demonstrations used at the University of Wisconsin in a materials science course for nontechnical students. Topics include crystal models, thermal properties, light, and corrosion.

ED 118 815

Consumerism: Life Centered Curriculum Program
Syracuse (New York) City School District
1974 168pp
EDRS price $0.83 MF HC $8.69 plus postage

Components - Contains about 80 "student activity" sheets grouped into five "objective" areas

Status - Most activity sheets are classroom ready

Materials - None

Mode - Discussion, problem solving, environment interpreting data, simulation

Context - Psychology (mathematics, social studies)

Target - Grades 4-9

Themes - a - perception
b - interpreting data
c - advertising
d - consumerism, decision making, natural resources

The mid-intermediate elementary level curriculum guide on consumerism is designed to help students better define their own value system, develop an improved decision-making procedure, evaluate alternatives in the marketplace, and understand their consumer rights and responsibilities. The guide contains five sections related to five major objectives: to develop an understanding of the term "consumerism", to provide self evaluation of consumer experiences, to understand the historical developments that led to the consumer movement, to understand consumer rights and responsibilities, and to recognize consumer abuse and learn the process of registering complaints. Large group strategies, small group strategies, and student activity sheets are included for each of the five subsections. Several teacher information sheets also are included. Some of the topics covered are: freshness codes, advertisments, recycling, checking container information, installment buying, consumer protection laws, guarantees, contracts, and the City of Syracuse Consumer Affairs Unit. A behavior inventory and simulation activities are provided.

Stapp, W. and D. Cox
Environmental Education Activities Manual: Book 3
1974 150pp
D. A. Cox, 30808 Lamar, Farmington Hills, MI 48024 (sold only as a set of six books $10.00)
EDRS price MF $0.83 plus postage

Components - Contains a great variety of activities including specific and detailed objectives, procedures, etc. addressed to teachers. Most intended for teacher directed class groups and require one to six days.

Status - Student guidesheets need to be developed for each activity. Could be individualized by proper adaptation.

Materials - Most simple and easy to obtain. Some specialized equipment such as a camera is needed for certain activities. Some materials to be specially prepared prior to activity.

Mode - Environment, laboratory, film, discussion, field trip, problem solving.

Context - Ecology, technoloby, zoology, botany

Target - Grades 3-5

Themes - a - population, system, interaction
b - interpreting data, observing, measuring
c - population, pond, stream, growth
d - technological impact, decision making, resources usage, consumerism, land use, water pollution, solid waste, air pollution

This activities book for the middle elementary grades is the third book of a series of six books designed to provide developmental K-12 experiences designed to support the basic environmental philosophy of spaceship earth presented in Book I. The aims of the four activity sections of this book are to aid in developing students to make them more sensitive to their environment, able to recognize problems, reach a sophistication in using problem solving skills, and inclined to participate in action activities to deal with environmental problems. The Concept Development Activities Section was developed to assist teachers in assisting students to further their understanding of major concepts basic to the development of an environmentally literate citizenry. These concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics. The Skill Developing Activities Section identifies eight skills as being essential to the environmental problem solving process. For each of the eight skills, skill developing activities have been designed. The Values Clarification Activities Section contains sample strategies that teachers have found helpful is assisting students to clarify their values regarding environmental issues. The Environmental Encounters Activities Section contains a series of school-community environmental problem solving activities.

ED 119 947

Stapp, W. and D. Cox
Environmental Education Activities Manual: Book 4
1974 169pp
D. A. Cox, 30808 Lamar, Farmington Hills, MI 48024 (sold only as a set of six books $10.00)
EDRS MF $0.83 plus postage

Components - Contains a great variety of activities including specific and detailed objectives, procedures, etc. addressed to teachers. Most intended for teacher directed class groups and require one to six days.

Status - Student guidesheets need to be developed for each activity. Could be individualized by proper adaptation.

Materials - Most simple and easy to obtain. Some specialized equipment such as a camera is needed for certain activities. Some materials to be specially prepared prior to activity.

Mode - Laboratory, environment, problem solving, discussion, game, data bank, field trip, survey, film, slides

Context - Ecology, botany, sociology, technology, psychology

Target - Grades 4-6

Themes - a - energy, system, population, quantification
b - measuring, observing, interpreting data
c - population
d - energy conservation, resource usage, solid waste, sound pollution, decision making, futurism

This activities book for the upper elementary grades is the fourth book of a series of six books designed to provide developmental K-12 experiences designed to support the basic environmental philosophy of spaceship earth presented in Book 1. The aims of the four activity sections of this book are to aid in developing students to make them more sensitive to their environment, able to recognize problems, reach a sophistication in using problem solving skills, and inclined to participate in action activities to deal with environmental problems. The Concept Development Activities Section was developed to assist teachers in assisting students to further their understanding of major concepts basic to the development of literate citizenry. These concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics. The Skill Developing Activities Section identifies eight skills as being essential to the environmental problem solving process. For each of the eight skills, skill developing activities have been designed. The Values Clarification Activities Section contains sample strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. The Environmental Encounters Activities Section contains a series of school-community environmental problem solving activities.

ED 119 948

Stapp, W. and D. Cox
Environmental Education Activities Manual: Book 5
1974 199pp
D. A. Cox, 30808 Lamar, Farmington Hills, MI 48024 (sold only as a set of six books $10.00)
EDRS price MF $0.83 plus postage

Components - Contains a great variety of activities including specific and detailed objectives, procedures, etc. addressed to teachers. Most intended for teacher directed class groups and require one to six days.

Status - Student guidesheets need to be developed for each activity. Could be individualized by proper adaptation.

Materials - Most simple and easy to obtain. Some specialized equipment such as a camera is needed for certain activities. Some materials to be specially prepared prior to activity.

Mode - Discussion, survey, environment, simulation

Context - Psychology, technology, ecology, botany, zoology, geology

Target - Grades 6-9

Themes - a - popultaion
b - interpreting data
c - population, growth
d - decision making, resources usage, futurism, energy conservation, technological impact.

This activities book for the junior high level is the fifth book of a series of six books designed to provide developmental K-12 experiences designed to support the basic environmental philosophy of spaceship earth presented in Book 1. The aims of the four activity sections of this book are to aid in developing students to make them more sensitive to their environment, able to recognize problems, reach a sophistication in using problem solving skills, and inclined to participate in action activities to deal with environmental problems. The Concept Development Activities Section was developed to assist teachers is assisting students to further their understanding of major concepts basic to the development of an environmentally literate citizenry. These concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics. The Skill Developing Activities Section identifies eight skills as being essential to the environmental problem solving process. For each of the eight skills, skill developing activites have been designed. The Values Clarification Activities Section contains sample strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. The Environmental Encounters Activities Section contains a series of school-community environmental problem solving activities.

Stapp, W. and D. Cox
Environmental Education Activities Manual: Book 6
1974 211pp
D. A. Cox, 30808 Lamar, Farmington Hills, MI 48024 (sold only as a set of sex books $10.00)
EDRS price MF $0.83 plus postage

Components - Contains a great variety of activities including specific and detailed objectives, procedure, etc. addressed to teachers. Most intended for teacher directed class groups and require one to six days.

Status - Student guidesheets need to be developed for each activity. Could be individualized by proper adaptation.

Materials - Most simple and easy to obtain. Some specialized equipment such as a camera is needed for certain activities. Some materials to be specially prepared prior to activity.

Mode - Environment, simulation, discussion, data bank, laboratory

Context - Ecology, technology, sociology, economics

Target - Grades 7-12

Themes - a - population, cycles, system, equilibrium
b - interpreting data
c - population
d - air pollution, sound pollution, noise pollution, technological impact, transportation, solid waste, futurism, energy sources.

This activities book for the senior high school level is the sixth book of a series of six books designed to provide developmental K-12 experiences designed to support the baisc environmental philosophy of spaceship earth presented in Book 1. The aims of the four activity sections of this book are to aid in developing students to make them more sensitive to their environment, able to recognize problems, reach a sophistication in using problem solving skills, and inclined to participate in action activities to deal with environmental problems. The Concept Development Activities Section was developed to assist teachers in assisting students to further their understanding of major concepts basic to the development of an environmentally literate citizenry. These concepts are: ecosystem, population, economics, and technology, environmental decisions, and environmental ethics. The Skill Developing Activities Section identifies eight skills, skill developing activities have been designed. The Values Clarification Activities Section contains sample strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. The Environmental Encounters Activities Section contains a series of school-community environmental problem solving activities.

Elementary Environmental Learning Packet K-3
(USOE) Brevard County School Board, Cocoa, Florida
1975 135pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Contains "student cards" (53) describing activities and addressed to teachers. Also includes references for each activity.

Status - Student guidesheets need to be developed.

Materials - Varies from none to simple prepared materials

Mode - Discussion, prepare a visual, reading

Context - Zoology, ecology, entomology, geology, botany, sociology, ethology, (art, social studies)

Target - Although intended for grades K-3 the activities could be used up to grade 5.

Themes - a - change, inteaction, cycle
- b - inferring, predicting
- c - sand, trees, water, soil
- d - food supply, pesticides, solid waste, recycling, endangered species

This environmental education program consists of two levels; primary and intermediate. The material in this publication encompasses the primary level. The learning materials are activity-based and incorporate process and subject area skills with knowledge and concern for the environment. The program is also interdisciplinary including activities and skills from art, language arts, mathematics, music, science, and social studies. The activities in this primary set center on sensory awareness, basic ecological concepts, and developing positive attitudes toward the environment. The materials consist of student activity cards, student information cards, and the teachers guide. Each activity card introduces the environmental concept and lists activities and an informal evaluation. The cards are non-graded and non-sequential. The teacher's guide contains overall teaching suggestions and suggestions by card. It also included references for eachcard and four indexes on subject, subject area and process skills information cards, and outdoor activities.

ED 119 961

Elementary Environmental Learning Packet Grades 4-6
(USOE) Brevard County School Board, Cocoa Florida
1975 163pp
EDRS price $0.83 HC $8.69 plus postage

Components - Contains "student cards" (54) which are actually addressed to teachers. A list of resources for each activity is included.

Status - "Student cards" need to be rewritten so as to be addressed to students although they could be used as-is with student interpretation. Some activities need to be modified to fit local situations and to be more specific.

Materials - Requirements range from nothing to simple prepared materials to standard laboratory apparatus such as microscopes.

Mode - Discussion, reading, environment

Context - Botany, chemistry, physics, zoology, ecology
(language arts, mathematics)

Target - Grades 4-8

Themes - a - change, interaction, population
b - measuring, classifying
c - plants, soil, water, population
d - land use, survival, housing, water supply, solid waste, population, air pollution, transportation, energy conservation, sound pollution

This environmental education program consists of two levels; primary and intermediate. The material in this publication encompasses the intermediate level. The learning materials are activity-based and incorporate process and subject area skills with knowledge and concern for the environment. The program is also interdisciplinary including activities and skills from art, language arts, mathematics, music, science, and social studies. The activities in this intermediate set center on exploration of the environment, identifying and solving environmental problems, and developing positive attitudes toward the environment. The materials consist of student activity cards, student informatin cards and the teacher's guide. Each activity card lists the environmental problem, suggestions for investigating the problem, and an informal evaluation. The cards are non-graded and non-sequential. The teachers guide contains overall teaching suggestions and suggestions by card. It also includes references for each card and four indexes on subject, subject area and process skills, information cards, and outdoor activities.

Bemiss, C.
Man's Impact on the Environment: The Barrier Beach as an Ecosystem
Brevard County School Board, Cocoa, Florida
1975 134pp
EDRS price MF $0.83 HC $7.35 plus postage

Components - A sequential set of learning activities that focus on a Florida barrier beach and associated problems. Activity generating questions and plans for using with students are directed to teacher: Over 60 pages of textual material.

Status - Individual guidesheets needed and local adaptions made. Could serve as framework for a total unit.

Materials - Essentially self contained. A few specially prepared pictures and slides required.

Mode - Discussion, reading, slides, film

Context - Geology, ecology, technology

Target - Grades 9-12

Themes - a - equilibrium, system, change
b - predicting
c - sand, beach
d - technological impact, natural resources

None of the activities involve concrete experience with the beach.

This environmental education program emphasizes the cause and effect of change in a barrier beach ecosystem with special attention given to man and his role in environmental change. Concepts are employed from the natural and social sciences to investigate environmental problems. The units are designed around these questions: (1) What is an ecosystem?; (2) What is a description of the ecosystem being investigated?; (3) What are some of the biotic and abiotic features of the ecosystem and how do these features interrelate?; (4) Where are some specific locations of the ecosystem being investigated? (5) What biotic and abiotic features in the ecosystem have changed and are undergoing change?; (6) What are the natural factors causing change in the ecosystem on the ecosystem and how have they been brought about?; (8) What are the results of the changes?; (9) What if any, new changes are needed in the ecosystem?; and (10) How might these needed changes to the ecosystem be brought about? The units are inquiry oriented and contain learning activities, resources evaluation techniques, and teacher suggestions for implementation of the program. Readings, maps, and other handouts are given for learner use. Slides with descriptions are included.

ED 119 963

Bemiss, C.
Man's Impact on the Environment: The City as an Ecosystem
Brevard County School Board, Cocoa, Florida
1975 180pp
EDRS price MF $0.83 HC $ 10.03 plus postage

Components - A sequential set of learning activities that focus on the city. Questions for study and objectives are addressed to teacher. Much textual material.

Status - Local adaptations needed to include concrete experience. Guidesheets needed. Might serve as an idea base for a total unit.

Materials - None

Mode - Reading, discussion, slides, film

Context - Technology

Target - Grades 9-12

Themes - a - equilibrium, system
b - predicting
c - city, growth
d - air pollution, noise pollution, solid wastes, futurism

This environmental education program emphsizes the cause and effect of change in a city ecosystem with special attention given to man and his role in environmental change. Concepts are employed from the natural and social sciences to investigate environmental change. Concepts are employed from the natural and social sciences to investigate environmental problems. Unit activities are inquiry oriented and answer these questions: (1) What is an ecosystem?; (2) What is a description of the ecosystem being investigated?; (3) What are some of the biotic and abiotic features of the ecosystem and how do these features interrlate? (4) where are some specific locations of the ecosystem being investigated?; (5) What biotic and abiotic features in the ecosystem have changed and are undergoing change?; (6) What are the natural factors causing change in the ecosystem and how have they been changed?; (7) What are the man-made factors causing change in the ecosystem and how have they been brought about?; (8) What are the results of the changes?; (9) What, is any, new changes are needed in the ecosystem?; and (10) How might these needed changes to the ecosystem be brought about? Questions 5-10 are designed into a role-playing simulation game. The guide also contains readings, maps and other handouts, resources, evaluction techniques and teacher suggestions for program implementation. Slides with descriptions are included.

ED 120 348

Zupfer, J. and others
Career Related Science Units
Roseville (Minnesota) Area School District
1973 395pp
EDRS price MF $0.83 HC $20.75 plus postage

Components - Contains 89 activity guides ("modules") addressed to individual students. Each guide is self contained, accompanied by a short "teacher supplement", and includes a "pretest and prerequisites". Activities run from one day to two weeks.

Status - Many if not most of the guides are classroom ready. Modified guidesheets may be needed for local use.

Materials - Standard junior high science equipment plus some specialized and relatively expensive theings for certain activities.

Mode - Laboratory, reading, problem solving, survey

Context - Botany, genetics, technoloby, physics, chemistry, electronics, zoology, physiology, psychology, sociology

Target - Grades 7-12

Themes - a - system, energy, interaction, cause-effect, perception, population, cycles
b - measuring, controlling variables, classifying, communicating, interpreting data
c - soil, plants, ponds, water, hair
d - food supply, identifying people, consumerism, corrosion, nutrition, radioactivity, health

Some of the acitvities are very feasible and have a high interest potential for students. Others may be too difficult, require complex material, or otherwise lack feasibility.

The document is comprised of 91 career-related science modules for junior high school students, indexed by the learning activity's title and cross-referenced by occupation. The modules are intended for use in an individualized science program, either as an ongoing curriculum supplement or as a discrete unit. Integrated with the presentation of scientific theory, knowledge, and skills are information on applications in work settings and on employment opportunities in science and other fields. Problem-solving and science learnings relevant to students' practical, daily needs are emphasized. The module format, an illustrated worksheet, includes; title, cluster, occupation, prerequisites, objectives, equipment, procedure, data and results, evaluation, and teacher supplement. Most of the modules were designed to be completed during a 50 minute period, with equipment which can be stored in a small container. An introductin orients the objectives, relates the goals and objectives of the career-science program, and specifies the science processes and skills which are developed in the modules. Alternative methods for using the modules are suggested, and a student introduction is provided. The modules are heavily biased toward traditional sex roles; no racial minorities are pictured in the illustrations.

ED 120 426

Principles of Pesticide Use, Handling, and Application
(EPA) Ellia Associates, Inc., College Park Maryland
1976 329pp
EDRS price $0.83 HC $18.07 plus postage

Components - Contains textual in the form of information sheets, which are short phrase factual outlines, overhead projecturals and assignment sheets, grouped in eleven units. Addressed to students mainly.

Status - Could be used as-is however, guidesheets will make more effective.

Materials - None

Mode - Lecture, discussion, problem solving

Context - Ecology, botany, entomology, zoology, chemistry

Target - Grades 10-12

Themes - a - system
b - interpreting data
c - insects
d - pesticides, insect damage, food supply, consumerism, weeds

The training package is designed to present the basic principles of pesticide use, handling, and application. Included in this package is information on Federal laws and regulations, personal safety, environmental implications, storage and disposal considerations, proper application procedures, and fundamentals of pest management. Successful completion of these training modules will equip the student with the basic requirements for private applicator pesticide certification as identified by Federal laws. The 11 training modules cover the following areas: an introduction; pests; environmental protection; pesticides, labels and labeling; personal safety and first aid; safety before, during, and following application;formulation and application; equipment and its use; disposal and storage; and recordkeeping and liability. Each unit is planned for one or more lesson or class period and includes behavioral objectives, suggested activities for teacher and student, information sheets, assignments sheets, visual aids, tests and test answers.

ED 121 565

Bennett, D. and W. Willink
Environmental Education Teachers Guide - High School
(USOE) Maine Environmental Education Project, Yarmouth
1974 148pp
Maine Environmental Education Project, Intermediate School, Yarmouth
ME 04096 Free
EDRS price MF $0.83 HC $7.35 plus postage

Components - Contains background information objectives and activities grouped in six parts. Most activities last one class period. Addressed to teachers and set in the context of Maine.

Status - Needs to be adapted to the local situation and guidesheets prepared.

Materials - Mainly simple readily available materials although a special film and prepared slides are required, for some activities.

Mode - Discussion, survey, film, lecture, simulation, reading

Context - Ecology, technology

Target - Grades 9-12

Themes - a -
b -
c -
d - land use

The simulation involving a community decision making process on a land use issue is an especially good model which can be adapted.

This Environmental Education Teacher's Guide is designed for use with the Maine Land-Use Challenge, a mini-course designed for use in the secondary schools. The mini-course itself grew out of a day-long land-use conference in 1971, sponsored by the Allagash Institute, in the coastal town of Phippsburg, Maine. The conference was filmed and edited against the background of the Phippsburg penisula, into a 30-minute sound and color film, MAINELAND, which serves as the basis for this unit of study. The major goal of this mini-course is to help students acquire an understanding of the need for land-use planning and to help them acquire the motivation and ability to participate in sound land-use decision making. The guide is divided into six parts: Land-Use Values Clarification; The History of Land-Use; a Community Land-Use Case Study (slide presentation); Simulation of a Community Land-Use Issue; Follow-up Considerations; and Selected Bibliography. The Appendices include; pre-and post-tests, MAINELAND film outline, a community survey, and charts.

Bennett, D. and W. Willink
Environmental Education Teachers Guide, Junior High School
(USOE) Maine Environmental Education Project, Yarmouth
1975 75pp
Maine Environmental Education Project, Intermediate School District, ME 04096 Free
EDRS price $0.83 HC $3.50 plus postage

Components - Contains five "core activities" each of which would require 1-3 hours of time. Deals with a specific and typical Maine situation, addressed to teachers.

Status - Although some of the data tables and guide are ready for use, adaptation is needed for the local situation and guidesheets made.

Materials - Simple and readily available plus three slide sets and a few overhead projecturals which need to be made locally.

Mode - Discussion, lecture, environment, problem solving

Context - Ecology, geology

Target - Grades 7-10

Themes - a - system, population
b - interpreting data, communicating
c - woods
d - water supply, land use

This Environmental Education Teacher's Guide, developed for use in the junior high schools, is designed to familiarize teachers with how an environmental education program can help in their teaching and in achieving the goals of the school. The suggested core activites in this guide are designed to be a motivating way of introducing junior high school students to a practical understanding of the natural environment. The activities focus on those factors important in evlauating the stability of natural ecosystems and thereby identify areas sensitive to human development. The practicality of the unit is enhanced by the application of stability concepts in the content of a watershed. The activities have been devised to develop specific understandings, feelings, and skills are identified and a pre-post test is included to help the teacher assess educational outcomes.

Bennett, D. and W. Willink
Environmental Education Teachers Guide, Junior High School
(USOE) Maine Environmental Education Project, Yarmouth
1975 64pp
Maine Environmental Education Project, Intermediate School, Yarmouth
ME 04096 Free
EDRS price $0.83 HC $3.50 plus postage

Components - Contains five "core activities" each of which would require 1-3 class periods and organized around theme of land use. Includes a test. Data is based on the town of Yarmouth, Maine.

Status - Some worksheets are ready for use although guidesheets would help. Also the activities would ideally be adapted by using a local site.

Materials - Simple materials although slides and overhead projecturals need to be prepared ahead of time.

Mode - Discussion, problem solving

Context - Ecology, geology

Target - Grades 7-10

Themes - a -
b - classifying
c -
d - land use

This Environmental Education Teacher' Guide, developed for use in the junior high school, is designed to familiarize teachers with how an environmental education program can help in their teaching and in achieveing the goals of the school. The suggested core activities in this guide are designed to be a motivating way of introducting junior high school students to a practical understanding of the human environment. The activities focus on those factors important in evaluating the compatibility of land uses with each other and with the natural environment. The practicality of the unit is enhanced by the application of facts and concepts to a developed river corridor. The activities have been devised to develop specific understandings, feelings, and skills. Basic concepts, attitudes, objectives, and skills are identified and a pre-post test is included to help the teacher assess educational outcomes.

ED 121 950

Orientation to Bicycles - Workbook
Consumer Product Safety Commission, Washington
1975   75pp
EDRS price MF $0.83   HC $3.50   plus postage

Components - This contains a systematic though brief introduction to the bicycle and its parts which is purely descriptive. Spaces for answers to recall questions at end of each section. Brief bibliography.

Status - Classroom ready. Could be used as a source of ideas and related modules for a unit on "Bicycles".

Materials - None

Mode - Reading

Context - Technology

Target - Grades 8-12

Themes - a - system
b -
c - bicycles
d - safety, transportation

The workbook is intended to provide personnel having responsibility for bicycle investigations or inspections with an overview and technical information on bicycles which will serve as a technical foundation for understanding the bicycle regulations. It discusses bicycles in general, and introduces the user to the specific parts of bicycles. On completion of the workbook participants should be able to complete the following objectives: (1) define the different types of bicycles, including their distinguishing features; (2) identify the factors that contribute to bicycle accidents; (3) identify the five major systems of bicycles; and (4) locate and describe specific parts of bicycles Part I (12 pages) discusses briefly the history of bicycles, types of bicycles, the bicycles market, and bicycle accidents. Part 2 (41 pages) discusses in detail the various parts of the bicycle; seat, steering system, frame system, wheel system, drive system, and brake systems (coaster or pedal-operated brakes and caliper or hand-operated brakes). Exercises and answer keys accompany each section. Detailed illustrations and diagrams are found throughout the document. The document concludes with three appendixes; bicycle illustrations for different types of bicycles, glossary of bicycle terms, and a bibliography.

ED 123 055

Reilly, D.
Correlated Enrichment Environmental Activities for S. A. P. A.
(NSF) Del Mod System, Dover, Delaware
1973 139pp
State Supervisor of Science, John G. Townsend Bldg. Dover, DE 19901
Free while supply lasts
EDRS price MF $0.83 HC $ 7.35 plus postage

Components - Contains activities (62) addressed to teacher and which occur outdoors.

Status - Can be used as they are although guidesheets needed for older learners.

Materials - Simple and easily available materials. A land laboratory would help.

Mode - Environment, discussion, lecture

Context - Botany, zoology, geology, ecology

Target - Grades K-4

Themes - a - perception, symmetry, organism, change, system, cycles
b - classifying, observing, measuring
c - trees, streams, marshes
d -

These environmental enrichment activities were written by teachers, consultants in workshops and institutes . The activities are appropriate for K-3. For each level the sequence of original activities including the new environmental activities is listed. General objectives for the level are given. The enrichment activities list materials, objectives, trip procedures and questions, and audiovisual materials. The activities were developed for field work as part of outdoor education.

ED 123 417

Allied Health Field, Seventh Grade
Connecticut University, Storrs
1973 158pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Contains a number of student worksheets plus ideas for activities. Activities are grouped units (4).

Status - Modification of some activities and development of guidesheets are desirable although most worksheets can be used in their present state.

Materials - Easily obtained materials except a few activities require preparation of them in advance of class.

Mode - Survey, film, simulation, environment, interview, demonstration, laboratory

Context - Sociology, chemistry, physics, physiology, psychology, (careers)

Target - Grades 6-8

Themes - a - quantification, perception, energy
b - classifying, interpreting data, measuring, observing, inferring
c -
d - health, nutrition, air pollution

The two-part set consists of a student handbook and a related teachers handbook in allied health education for use at the seventh grade level. The student handbook contains four units: (1) investigating health care needs, (2) mental health-study of differnet types of job roles and their related activities and skills, (3) treatment-diagnosis of helath problems, and (4) pollution in our environment-study of relationships between pollution and health. Each unit provides learning activities and exercises for obtaining knowledge in different areas of the health field, pariticularly in the process of gathering, recording, analyzing, and diagnosing health needs data. The exercises provided in the student handbook are referred to in the teachers' handbook, which focuses on the same units provided in the student handbook, and presents suggestions for learning processes and activities, notes, and resource materials.

ED 123 419

Allied Health Field: Ninth Grade
Connecticut University, Storrs
1974 172pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Contains some activities outlined for learner use along with suggestions for others. Activities are grouped according to related health professions.

Status - Most activities require some development and preparation of guidesheets prior to use.

Materials - Mostly common laboratory equipment and simple materials.

Mode - Reading, interview, laboratory

Context - Anatomy, anthropology, chemistry, physics, physiology (careers)

Target - Grades 8-10

Themes - a -
b -
c - population
d - health, normalcy

The two-part set consists of a student hand-book and a related teachers' handbook in allied health education for use at the ninth grade level. The student handbook contains nine units which focus on the science curriculum: (1) introduction, (2) weights and measures, (3) human body,(4) chemistry, (5) electricity and magnetism, (6) heat and its effects, (7) fluid dynamics, (8) wave motion and sound, and (9) light. Each unit presents a general introduction to the subject area, objectives vocabulary words to be defined, related professions, and learning activities and exercises for acquiring skills and understanding concepts related to a particular health field. The teachers' handbook to the above units and a curriculum guide outline for a course applying scientific information to allied health professions. The curriculum lists the objectives of the course and suggests speakers from different professions. A study outline of the course based on the nine units is presented briefly. Also included in the teachers' guide are suggested resources; a description of films, filmstrips, and printed materials; a list of films and their suppliers; and suggested laboratory studies.

ED 123 420

Smith, T.
Allied Health Field: Tenth grade
Connecticut University, Storrs
1974   97pp
EDRS price $0.83 MF   HC $4.67 plus postage

Components - Contains activity whorksheets that involve bacteriological and clinical techniques.

Status - Can be used as is although guidesheets would be helpful.

Materials - Standard laboratory equipment and materials needed.

Mode - Laboratory

Context - Chemistry, bacteriology, physiology (careers)

Target - Grades 10-12

Themes - a - interaction
b - measuring, observing, classifying
c - water, blood
d - water pollution, water supply, disease, normalcy

The two-part set consists of a student handbook and a related teachers' handbook in allied health education for use at the tenth grade level. The student handbook consists of seven units which focus on the biology curriculum: (1) community water examination, (2) bacteriological examination of water, (3) the microscope, (4) microbes and man, (5) paper chromatography, (6) the transport system (part 1: heart rate and blood pressure, and part 2: examination of the blood), and (7) individual study--a report on a communicable or hereditary disease. Each unit offers learning activities and exercises which center on laboratory work in order to assist students in obtaining knowledge and skills related to allied health occupations. The teachers handbook provides suggestions for activities to assist teachers in the instruction of five of the above units: (1) the microscope, (2) microbes and man, (3) paper chromatography, (4) transport system, and (5) examination of water.

ED 123 421

Fister, A.
Allied Health Field: Eleventh Grade
University of Connecticut, Storrs
1974 198pp.
EDRS price $0.83 MF HC $ 10.03

Components - Contains laboratory worksheets, factsheets, and guides to films and interviews addressed to student.

Status - Can be used in present state although guidesheets would help.

Materials - Mainly easy to obtain materials.

Mode - Laboratory, reading, film, interview, field trip, simulation, lecture.

Context - Technology, anatomy (career)

Target - Grades 11-12

Themes - a -
b - classifying, observing, measuring
c - blood
d - health, nutrition, ethics

The two-part set consists of a student handbook and a related teachers handbook in allied health education for use at the eleventh grade level. The student handbook consists of five units related to health care services; (1) introduction to allied health and the concept of the health care team, (2) medical technology, (3) nutrition, (4) rehabilitation , and (5) nursing. Each unit provided learning activities and exercises for obtaining knowledge and skills in various health occupations and to acquire information on their roles in the field of health care services. The exercises provided in the student handbook are referred to in the teachers' handbook. which focuses on the same units provided in the student handbook. Each unit presents suggestions for learning processes, activities, notes, and materials.

ED 124 370

Bullock, B. and others
Automobile Ignition System - Minicourse
Dallas (Texas) Independent School District
1974 155pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Consists of a series of "activities" (55) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components are classroom ready although simple guidesheets would be helpful.

Materials - Ordinary laboratory equipment. Reading would be enhanced if actual automobile devices were available for first hand examination.

Mode - Reading, laboratory, problem solving.

Context - Physics, technology, chemistry.

Target - Grades 9-12

Themes - a - model, field
b - measuring
c -
d - automobile maintenance

This minicourse treats the usual topics of current electricity and magnetism as they can be related to on automobile ignition system.

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing the student with a basic understanding of the construction and operation of the ingnition system of an automobile. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities and resource packages are included. Student activities and resource packages involve studying the fundamentals of electricity and magnetism, investigating eletromagnetism, constructing a battery, and examining the construction and operation of a generator, voltage regulator, ignition coil, distributor, condenser, and spark plug.

Bullock, B. and others
Ballistics, Bullets and Blood - Minicourse
Dallas (Texas) Independent School District
1974 76pp
EDRS price MF $ 0.83 HC $ 4.67 plus postage

Components - Consists of a series of "activities" (19) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Essentially classroom ready if simple guidesheets are prepared.

Materials - Standard physics laboratory equipment.

Mode - Laboratory, reading, problem solving.

Context - Physics

Target - Grades 11-12

Themes - a -
b - predicting, inferring
c - motion
d - crime

Most of the material is standard physics stuff. However, the last group of activities is an innovation and uses a drop of blood and the inferring process.

This minicourse was prepared for use with secondary physics students in the Dallas Indepenedent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing the student with an understanding of the physics of falling objects, projectiles, and missiles. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Tile III project. A rationale, behavioral objectives, student activities, and resource packages are included. Student activities and resource packages involve reading about firearm ballistics, free fall, and acceleration,investigating trajectory, analyzing general projectile motion, investigating conservation of momentum and rocket propulsion and a study of blood ballistics.

ED 124 372

Bullock B., and others
Basic Machines: The Nuts and Bolts of Technical Physics - Minicourse
Dallas (Texas) Independent School District

1974 113pp
EDRS price MF $0.83 HC $ 6.01 plus postage

Components - Consists of a series of "activities" (25) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most of the material is classroom ready.

Materials - Standard physics laboratory equipment.

Mode - Reading, laboratory.

Context - Physics

Target - Grades 10-12

Themes - a - energy, force, equilibrium
b - interpreting data
c -
d -

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at two levels in the study of basic machines. The "light" level introduces the basic machines of technical physics. The "heavy" level treats the technical aspects of motion associated with basic machines in a precise and mathematically involved fashion. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities and resource packages involve investigating levers, pulleys, wheel and axle, inclined plane, and screw jack machines, and applying the concept of mechanical advantage. A technical description of forces, moments, equilibrium, and motion emphasizes the vector nature of forces and moments and uses mathematical representations and analyses of these.

Bullock, B. and others
Climatizing the Home - Minicourse
Dallas (Texas) Independent School District
1974 116pp
EDRS price MF $0.83 HC $6.01

Components - Consists of a series of "activities" (15) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components are classroom ready although some require learner guidesheets to be prepared.

Materials - Usual laboratory equipment.

Mode - Demonstration, laboratory equipment.

Context - Physics

Target - Grades 10 - 12 plus

Themes - a - energy, gradient
b - measuring
c - water, climate
d - energy conservation, climate control

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing students with a knowledge of the physics factors that determine the sensation of climatic comfort and the energy requirements for maintaining this comfort. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities, and resource packages are included. Student activities and resource packages include defining temperature, calibrating a thermometer, defining heat, investigating conduction, connection, radiation, specific heat, heat of fusion, insulating material, humidity, and dew point, and calculating heating loads.

ED 124 374

Bullock, B. and others
Introductory Minicourse
Dallas (Texas) Independent School District
1974 60pp
EDRS price MF $0.83 HC $3.50 plus postage

Component - Consists of a series of "activities" (5) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components are classroom ready although some require learner guidesheets to be prepared.

Materials - Simple readily available materials and equipment.

Mode - Laboratory, demonstration, reading.

Context - General, physics.

Target - Grades 9-12

Themes - a - force
b - hypothesizing, controlling variables
c - flight, illusions
d -

This includes a widely applicable set of activities on the aerodynamics of paper gliders.

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District. This is an introductory minicourse aimed at acquainting the student with the realm of physics so that the student can pursue further study by selecting those minicourses most relevant to his career needs and interests. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavior objectives, student activities, and resource packages are included. Student activities and resources packages are included. Student activities and resource packages include paper puzzles, manipulative puzzles, paper glider construction analog computer construction, and a number of physics "tricks."

ED 124 375

Bullock, B. and others
Metric System and Slide Rule - Minicourse
Dallas (Texas) Independent School District
1974 98pp
EDRS price $0.83MF HC $4.67 plus postage

Components - Consists of a series of "activities (55) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP). Most of the metric activities are based on conversion from English to metric and vice-versa.

Status - Most are classroom ready. Some are very short and could be combined to form a single module.

Materials - None

Mode - Reading, problem solving (answers to most problems are given).

Context - General (mathematics).

Target - Grades 7-12

Themes - a - quantification
b - measuring
c -
d -

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing students with a knowledge of the metric system and use of the slide rule. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities, and resource packages are included. Student activities and resource packages involve reading about the development of the metric system, defining the meter, using mass and time units, converting from one system to the other, measuring mass, length, and volume,and performing the basic slide rule operations.

ED 124 376

Bullock, B. and others
Photography - Minicourse
Dallas (Texas) Independent School District
1974   91pp
EDRS price MF $0.83 HC $4.67 plus postage

Components - Consists of a series of "activities" (12) keyed to specific objectives. Includes relevant reading in commercially published books and pamphlets. Organized in the form of a Learning Activity Package (LAP)

Status - Many components are classroom ready while others require learner guidesheets to be prepared.

Materials - Materials readily available though some effort will be required to collect. Some apparatus can be constructed locally.

Mode - Demonstration, laboratory, reading.

Context - Physics, physiology, chemistry.

Target - Grades 9-12

Themes - a - model, change
b - observing, measuring, experimenting
c - light
d - recording images

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was designed to help students acquire a knowledge of some physics of photography and to develop some basic photographic skills. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities, and resource packages are included. Student activities and resource packages involve investigating career in photography, comparing the camera and the eye, studying some properties of light, making a camera, and taking and developing pictures.

ED 124 377

Bullock, B. and others
Physics of Communication - Minicourse
Dallas (Texas) Independent School District
1974 51pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - Consists of a series of "activities" (23) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Many components are classroom ready for use with simple guidesheets.

Materials - Standard laboratory and easily obtainable materials.

Mode - Laboratory, reading.

Context - Physics, technology.

Target - Grades 10-12.

Themes - a - model, resonance
b - inferring, communicating
c -
d - communication

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This mincourse was aimed at providing students with a knowledge of the ways in which light, sound, and electricity are involved in everyday communication systems. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title project. A rationale, behavioral objectives, student activities, and resource packages are included. Student activities and resource packages involve defining communication, investigating communication-related vocation, building a string telephone and telegraph, studying wave theory, constructing a simple radio receiver circuit, and examining how a loud speaker works.

Bullock, B. and others
Physics of Musical Instruments - Minicourse
Dallas (Texas) Independent School District
1974 59pp
EDRS price $0.83 MF HC $3.50 plus postage

Components - Consists of a series of "activities (21) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components are classroom ready if a simple guidesheet is prepared. Some teachers may want to modify these to add an inquiry dimension.

Materials - Assorted reference books, a specially prepared cassette tape and standard physics laboratory equipment.

Mode - Laboratory, reading.

Context - Physics

Target - Grades 10-12

Themes - a - resonance, model
b - interpreting data
c - sound
d - noise pollution

This minicourse was prepared for use with secondary physics students in Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing students with a knowledge of the technical descriptions of music, the differences between music and noise, and the ways in which various instruments produce sounds. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities and resource packages are included. Student activities and resource packages involve defining noise and music, taping sounds and noises, investigating careers in music, investigating vibrating strings, air columns and surfaces, exploring the role of temperature in sound transmission and making a noise pollution tape.

ED 124 379

Bullock, B. and others
The Physics of Sports - Minicourse
Dallas (Texas) Independent School District
1974 165pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Consists of a series of "activities" (21) keyed to specific objectives. Includes relevant readings in selected books and pamphlets. Some packages include self-tests. Organized in the form of a Learning Activity Package (LAP).

Status - Many components are classroom ready while others require learner guidesheets to be prepared.

Materials - Readily available materials including sports equipment.

Mode - Demonstration, laboratory, reading.

Context - Physics, general.

Target - Grades 10-12 plus.

Themes - a - system, force, equilibrium, energy
b - interpreting data
c - machines
d - human performance

This minicourse was prepared for use with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This mincourse was aimed at helping the student relate the concepts of work, power, energy, momentum, and simple machines to sports. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities and resource packages are included. Student activities and resource packages involve reviewing the playing details of seven sports, studying a few fundamental of physics and related mathematics, analyzing some technical physics of seven sports, investigating student horsepower, and analyzing mechanical and anatomical machines.

ED 124 380

Bullock, B. and others
Physics of Toys - Minicourse
Dallas (Texas) Independent School District
1974 119pp
EDRS price MF $0.83 HC $6.01 plus postage

Components - Consists of a series of "activities" (7) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP). Also contains numerous references to some common textbooks.

Status- Most components are classroom ready although adaptors will probably wish to prepare their own simple guidesheets.

Materials - Toys that are relatively common but will require some effort to find. Substitutions might work in certain cases.

Mode - Reading, laboratory film, filmstrip.

Context - Physics

Target - Grades 7-12

Themes - a - force, model, energy, field
b -
c - motion, sound, light
d - extending senses

This minicourse was prepared for use with secondary physics students in Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing students with an understanding of some basic physics principles by playing with toys that have been classified into five different groups on the basis of the principle that each demonstrates. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives student activities, and resource packages are included. Student activities and resources packages involve experimenting with toys that demonstrate force and motion, heat and thermodynamics, wave motion and sound, the principles of light, and electricity and magnetism.

Science and Superstition - Minicourse
Dallas (Texas) Independent School District
1974 25pp
EDRS price MF $ 0.83 HC $1.67 plus postage

Components - Consists of a series of "activities" (12) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components are classroom ready although most teachers will want to modify these to capitalize on local situations.

Materials - Usual library reference books and a specially prepared cassette tape.

Mode - Reading, survey, lecture.

Context - General

Target - Grades 7-12

Themes - a -
b - experimenting, hypothesizing, interpreting data, obtaining data, controlling variables.
c -
d - consumerism, superstition, popular beliefs.

This minicourse was prepared for use, with secondary physics students in the Dallas Independent School District and is one option in a physics program which provides for the selection of topics on the basis of student career needs and interests. This minicourse was aimed at providing the student with the opportunity to compare scientific theory with superstition, creating a better understanding of the processes involved in scientifically testing a belief. The minicourse was designed for independent student use with close teacher supervision and was developed as an ESEA Title III project. A rationale, behavioral objectives, student activities, and resource packages are included. Student activities and resource packages involve defining science, scientific method and superstition, surveying superstitions and investigating how superstitions develop and are disproved.

ED 124 382

Color - Minicourse
Dallas (Texas) Independent School District
1974 119pp
EDRS price MF $0.83 HC $6.01 plus postage

Components - Consists of a series of "activities" (17) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Ready for classroom use with appropriate guidesheets.

Materials - Basic physics apparatus, including a spectroscope.

Mode - Reading, data bank, laboratory.

Context - Physics, psychology.

Target - Grades 9-12 plus

Themes - a - model, perception
b -
c - light, color
d - reproducing images

Treats the business of additive and subtractive color which will be of use for people interested in color photography.

This instructional guide, intended for student use, develops the concept of color through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials.

ED 124 383

Electronics as a Hobby - Minicourse
Dallas (Texas) Independent School District
1974 66pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - Consists of a series of "activities" (11) keyed to specific objectives. Organized in the form of a Learning Activity Package(LAP) .

Status - Mainly ready for classroom use although some guidesheets will probably be needed.

Materials - Basic Electronics equipment and hardware. Some traditional physics equipment and a special booklet from Heath Kit.

Mode - Reading, laboratory, demonstration.

Context - Physics, technology

Target - Grades 9-12

Themes - a - energy
b - measuring
c -
d - power transmission

This instructional guide, intended for student use, develops the topic of electronics through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives; (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. The applications of electronics to hobbies are stressed. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

ED 124 384

Let There Be Light - Minicourse
Dallas (Texas) Independent School District
1974 134pp
EDRS price MF $0.83 HC $7.35 plus postage

Components - Consists of a series of "activities (13) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status-Ready for classroom use with simple guidesheets.

Materials - Standard Equipment for optics demonstrations.

Mode - Reading, laboratory, demonstration.

Context - Physics

Target - Grades 10-12 plus

Themes - a - model
b -
c - light
d -

Most of the material and activites are like that in most geometric optics sections of conventional physics texts.

This instructional guide, intended for student use, develops the concept of light through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. Along with a definition of light, the concepts, of reflection and refraction and such topics as fiber light and the photoelectric effect are developed. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

ED 124 385

Bullock, B. and others
Matter - A First Approach Minicourse
Dallas (Texas) Independent School District
1974 31pp
EDRS price MF $0.83 HC $2.06 plus postage

Components - Consists of a series of "activities" (6) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components require learner guidesheets.

Materials - Simple laboratory equipment and materials.

Mode - Laboratory, reading, demonstration

Context - Physics

Target - Grades 7-12 plus

Themes - a - model
b -
c - water
d -

This instructional guide, intended for student use, develops the concept of matter through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. A series of mini-experiments are described, providing explanations of density and changes of state. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

Bullock, B. and others
Model Rocketry - Minicourse
Dallas (Texas) Independent School District
1974 51pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - Consists of a series of "activities" (10) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most components are classroom ready although some require learner guidesheets to be prepared.

Materials - Usual laboratory apparatus plus toy water rockets and Estes model rocket sets and associated booklets.

Mode - Demonstration, laboratory, reading.

Context - Physics

Target - Grades 11-12 plus.

Themes - a - force, invariance (conservation).
b - experimenting, controlling variables
c - motion
d -

This instructional guide, intended for student use, develops the art of model rocketry through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. Activities lead through a development of the laws of motion through the actual construction and launching of a model rocket. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

ED 124 387

Bullock, B. and others
Nuclear Energy - Minicourse
Dallas (Texas) Independent School District
1974 41pp
EDRS price MF $0.83 HC 2.06 plus postage

Components - Consists of a series of "activities" (10) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Many components are classroom ready although some require learner guidesheets.

Materials - A few special pamphlets and books used but otherwise simple materials. Some specialized equipment needed.

Mode - Demonstration, reading, laboratory.

Context - Physics

Target - Grades 10-12 plus

Themes - a - energy
b - interpreting data
c -
d - radiation hazards, energy supply

This instructional guide, intended for student use, develops the concept of nuclear energy through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. Following a development of atomic structure, radiation detection and safety are considered. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

Radioactivity and Man - Minicourse
Dallas (Texas) Independent School District
1974 78pp
EDRS price MF $0.83 HC $ 4.67 plus postage

Components - Consists of a series of "activities" (4) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Most are classroom ready if simple guidesheets are prepared.

Materials - Standard physics and biology laboratory apparatus and materials. A geiger counter is needed for one laboratory exercise.

Mode - Reading, laboratory.

Context - Physics, physiology, technology.

Target - Grades 9 - 12

Themes - a - model
b - measuring, interpreting data,observing
c - radioactivity
d - extending senses, radiation safety

Simpler cloud chambers than the one described here can be made from a peanut butter jar and black felt.

This instructional guide, intended for student use, develops the subject of radioactivity and man through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5)resource packages, (6) evaluation materials. The benefits as well as the dangers of radioactivity to man are considered. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

ED 124 390

So You Gotta Wear Glasses - Mincourse
Dallas (Texas) Independent School District
1974 126pp
EDRS price MF $0.83 HC 7.35 plus postage

Components - Consists of a series of "activities" (4) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Essentially ready for classroom use.

Materials - Simple lenses, optical bench apparatus and an assortment of optical instruments such as a microscope.

Mode - Reading, problem solving, demonstration.

Context - Physics

Target - Grades 11-12 plus although some of the non-mathematical portions could be used down to grade 7.

Themes - a - model
b -
c - light
d -

This minicourse deals mainly with geometrical optics, optical instruments and the phenomena of refraction, diffraction, and polarization.

This instructional guide, intended for student use, develops the topic of optics through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. The study of light, particularly that concerning the use of lens systems in the refraction of light, is discussed. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

ED 124 392

Water Water Everywhere - Minicourse
Dallas (Texas) Independent School Course
1974 52pp
EDRS price MF $0.83 HC $3.50 plus postage

Components - Consists of a series of "activities" (12) keyed to specific objectives. Organized in the form of a Learning Activity Package (LAP).

Status - Ready for classroom use with guidesheets as needed. Several exercises could be modified to give added emphasis on learner inquiry.

Materials - Standard science equipment and school library books.

Mode - Laboratory, reading.

Context - Chemistry, physics, general, technology.

Target - Grades 9-12

Themes - a - density
b - measuring
c - water
d - water supply, boating safety

This instructional guide, intended for student use, develops the subject of water and its effects on our lives through a series of sequential activities. A technical development of the subject is pursued with examples stressing practical aspects of the concepts. Included in the minicourse are: (1) the rationale, (2) terminal behavioral objectives, (3) enabling behavioral objectives, (4) activities, (5) resource packages, and (6) evaluation materials. This unit is one of twelve intended for use in the second year of a two year vocationally oriented physics program.

ED 124 409

Radiological Safety Handbook
Army Ordnance Center and School, Aberdeen Proving Ground, Maryland
1976 835pp
EDRS price $1.67 MF HC $44.87

Components - Textual material outlined in brief sentence form. A few activities and student worksheets are also included.

Status - Text is somewhat awkward but a good source of facts could be rewritten or used as is.

Materials - None except for labs which require electronic or other radiation detection apparatus. Civil Defense instruments could be used.

Mode - Reading, problem solving, laboratory, environment

Context - Physics, physiology, technology

Target - Grades 11-12 plus

Themes - a - quantification, energy, model
b - measuring
c - radiation effects, radioactivity
d - radiation safety

Written to be used concurrently with the U.S. Army's Radiological Safety Course, this publication discusses the causes, sources, and detection of nuclear radiation. In addition, the transportation and disposal of radioactive materials are covered. The report also deals with the safety precautions to be observed when working with lasers, microwave generators, and particle accelerators. Work problems with solutions are provided for those topics mentioned.

ED 124 426

National Energy Outlook: 1976 Executive Summary
Federal Energy Administration, Washington
1976 17pp
Superintendent of Documents, USGPO, Washington, DC 20402
(#041-018-00102-6 $0.60
EDRS price MF $0.83 HC $1.67 plus postage

Components - Contains textual material in abbreviated form which is an authoritative summary of statistical data in an easily read form. Each page contains a graph pertaining to a specific aspect of the general problem.

Status - Ready for classroom use although, a guidesheet is needed to direct learners' actions.

Materials - None

Mode - Reading, data bank

Context - Technology

Target - Grades 7-12

Themes - a -
b -
c -
d - energy supply, natural resources, futurism

This brochure begins with findings and conclusions of the 1975 NATIONAL ENERGY OUTLOOK. Discussions of national energy topics follow including: What Are The Roots of Our Energy Problem? How Did We Become So Vulnerable to Oil Imports?; How Much Energy Will the Nation Consume?; How Will the Nation Meet Its Growing Energy Demands by 1985; How Much Energy Can be Saved; What Will Oil Imports Be by 1985; Where Will New Oil Supplies Come From? How Do Reserves Affect Domestic Production?; Will Natural Gas Production Continue to Decline?; What Will Be the Sources of Electricity in the Future?; How much Can New Technologies Contribute?; and How Much Will Energy Supply Investment Cost? Each one-page discussion includes depiction of the pertinent facts via multicolored graphs.

ED 124 428

NASA Facts - The Viking Mission
National Aeronautics and Space Administration, Washington
1976 13pp
Supt. of Documents, USGPO, Washington DC 20402 (#033-000-00622-5) $0.35
EDRS price MF $0.83 HC $1.67 plus postage

Components - Contains textual material plus three suggested activities.

Status - Guidesheets needed plus some development of suggested activities.

Materials - None except what needed for activities developed from suggestions.

Mode - Reading, laboratory, simulation

Context - Physics, biology, geology, technology

Target - Grades 8-12

Themes - a -
b - experimenting
c -
d - space travel, survival

Presented is one of a series of publications of National Aeronautics and Space Administration (NASA) facts about the exploration of Mars. The Viking mission to Mars, consisting of two unmanned NASA spacecraft launched in August and September, 1975, is described. A description of the spacecraft and their paths is given. A diagram identifying the five phases of the mission to Mars is presented. A diagram of the lander spacecraft and the orbiter spacecraft with the lander attached in cruise mode is included. Descriptive and pictoral views of landing sites and photographs taken with a Viking lander camera show some of the aspects of the science experiments being completed. A life detection experiment is explained in detail. Three student-oriented projects are given as well as a suggested reading list.

ED 124 430

NASA Facts, Mars and Earth
National aeronautics and Space Administration, Washington
1975 9pp
Superintendent of Documents, USGPO, Washington, DC 20402
(#033-000-00621-7) $0.35
EDRS price MF $0.83 HC $1.67 plus postage

Components - Contains textual material and graphic and tabular data. Suggestions for "student projects" (5).

Status - Guidesheets needed but reading material is classroom ready. Projects may need added details.

Materials - None

Mode - Reading, problem solving

Context - Geology, physics, meteorology

Target - Grades 10-12 beacuse reading level is rather high

Themes - a - change, system
b - interpreting data
c - life
d -

Presented is one of a series of National Aeronautics and Space Administration (NASA) facts about the exploration of Mars. In this publication, emphasis is placed on the sun's planetary system with note made that there is no one theory for the origin and subsequent evolution of the Solar System that is generally accepted. Ideas from many scientists are pointed out. The planatary atmospheres, climates, and the search being made for extra terrestrial life are discussed in this particular series. Photographs, diagramatic schemes and a table representing the evolution of living systems on Earth are included. Student projects are suggested as well as a reading list.

ED 124 451

Callahan, M. and others
Population: 1 plus 1 = 2 Many ?
National Council for Geographic Education (NCGE)
1975 14pp
NGCE Central Office, 115 North Marion St., Oak Park, Ill. 60301 $0.50
EDRS price $0.83 MF HC $ 1.67 plus postage

Components - A single activity addressed to teacher. Includes graphic data

Status - Simple student guidesheet needed

Materials - None

Mode - Problem solving, discussion, data bank

Context - Geography (social studies)

Target - Grades 7-12

Themes - a - population
b - interpreting data
c -
d - population, food supply

This activity, one in a set of teacher-developed instructional activities for elementary-level geography, investigates the problems and promise in meeting the nutritional needs of the world's people. Graphs are the principal media for instruction. Thirty-nine statements are given from which students choose ten that show promise for feeding the world's population and ten that offer the least help. Seven graphs are provided in the material. See SO 009140 for a general description and explanation of the elementary and secondary sets comprising this series.

ED 124 453

Rueff, J.
The City and government: The Art of Making Choices
National Council for Geogrpahic Education (NCGE)
1975 8pp
NCGE Central Office 115 North Marion St., Oak Park, Ill 60301 $0.50
EDRS price MF $0.83 HC $1.67 plus postage

Components - Contains a description of a group project and specific procedures for conducting it. Addressed to teachers.

Status - Needs guidesheets and extension of ideas if used in upper elementary grades.

Materials - Paint, paper and a specific filmstrip that is commercially available.

Mode - Slides, laboratory

Context - Geography, ecology

Target - Grades 3-6

Themes - a - scale, model, system
b - measuring, communicating
c - city
d - land use

This unit, one in a set of elementary teacher-developed materials for geography, is on land use in cities. It contains follow-up activities to the "Cities at Work" filmstrips, which are part of the "Our Working World" program published by Science Research Associates (SRA). The filmstrips deal with resource allocation and zoning problems in cities. The unit provides teachers with objectives, strategies, and further activities for this SRA program. For example, following the viewing of a filmstrip, students are asked to develop models and draw maps to illustrate land use, based on information given in the filmstrip. Some exemplary land use maps are included in the unit. See SO 009 140 for a general description and explanation of the elementary and secondary sets comprising this series.

ED 124 455

Huhn, B.
Primary Motion: Migration of Elementary Students
National Council for Geographic Education (NCGE)
1975   8pp
NCGE Central Office, 115 Marion St., Oak Park, IL 60301 ¢0.50
EDRS price MF $0.83   HC $1.67   plus postage

Components - Contains a set of programmed instruction frames and some demographic data to be used as a single module.

Status - Essentially classroom ready but a guidesheet would help.

Materials - None

Mode - Programmed instruction, data bank

Context - Demography

Target - Grades 5-9

Themes - a - population, change
b - interpreting data
c -
d - population, futurism

This unit, one in a set of elementary teacher-developed materials for geography, is geared to high middle-class income students in a suburban area who have traveled or migrated during their school years. The unit, a programmed instruction module that focuses on basic concepts of demography. Several questions are provided for which students must fill in blanks with population terms. Charts and an exemplary migration pattern of a class are included. See SO 009140 for a general description and explanation of the elementary and secondary sets that comprising this series.

ED 124 456

Donaldson, F.
Children Are Geographers: Explorations in Space
National Council for Geographic Education (NCGE)
1975 6pp
NCGE Central Office, 115 North Marion St., Oak Park, Il. 60301 $0.50
EDRS price $0.83 MF HC $ 1.67 plus postage

Components - Contains suggestions for three "exploration games" and one "exploration project". Addressed to teachers.

Status - Each activity requires some development and modification for local use. Probably best for groups. Guidesheets are needed.

Materials - None or simple and readily available.

Mode - Environment, laboratory

Context - Ecology, geography, entomology

Target - Grades 5-12

Themes - a - perception
b - interpreting data
c -
d - finding one's way

This unit, one in a set of teacher-developed materials for elementary geography, emphasizes that children act as geographers in activities that use a classroom as the environment. Exploration and discovery through game playing and maps are the techniques used for instruction as an alternative approach to content teaching by discussion. The first part of the unit provides examples of the geographic perspectives of young people, and the second part suggests three exploration games that can be used to develop geographic awareness. An exploration project is also described that involves discussion questions and a field trip in the students' neighborhoods. A bibliography is included. See SO 009 140 for a general description and explanation of the elementary and secondary sets comprising this series.

ED 124 457

Bravard, P.
Weather: A Learning Center Approach to the Teaching of Social Studies
National Council for Geographic Education (NCGE)
1975 13pp
NCGE Central Office, 115 North Marion St., Oak Park, Il 60301 $0.75
EDRS price MF $0.83 HC $1.67 plus postage

Components - Contains a set of (17) individualized activity suggestions assressed to teachers along with ideas for developing student job cards for each.

Status - Student job cards and/or guidesheets need to be made and some activities expanded.

Materials - Simple although some require preparation ahead of time.

Mode - Laboratory, slides, reading

Context - Geography

Target - Grades 2-3

Themes - a - cycles
b - classifying, measuring
c - weather
d -

This unit, one in a series of teacher-developed materials for elementary geography, is based on a part of a social studies textbook, "Topics of Life," Book Tow. One section proposes a learning center environment to make learning experiences in social studies possible throughout the entire school day. The text's section has been expanded for this unit into 17 learning stations adapted to various abilities of second-grade students. An instructional objective is stated for each learning station. Student experiences are provided in each area of the curriculum. The unit concludes with suggestions for beginning the learning center, evaluation suggestions, and a list of references. See SO 009 140 for a general description and explanation of the elementary and secondary sets that comprise this series.

ED 125 011

Wakefield, B.
Perception and Communication
ERIC Clearinghouse on Reading and Communication, Urbana
1976 32pp
Speed Communication Association, 5205 Leesburg Pike, Falls Church,
VA $1.50
EDRS price MF $0.83 HC $1.67

Components - Contains textual material and suggestions for classroom activities.

Status - Activities need to be developed and guidesheets prepared. Textual material is ready to use although reading level is relatively high.

Materials - None required except simple things to prepare in advance for some adtivities.

Mode - Reading, laboratory, survey

Context - Psychology

Target - Grades 7-12 although textual material has a high reading level.

Themes - a - perception
b - communicating, inferring
c - population
d -

The purpose of this booklet is to provide a summary of perception research andto suggest practical applications which will improve student's and teachers' communication ability. The "theory" section of this work is devoted to the definition of perception as a selective process, dependent on such factors as acuity of sensory equipment, physical point of view, psycholophysical condition, past experience, and present needs and purposes. The manner in which perception is used in communication and basic principles such as continuity, proximity, perceptual constancy, and figure-ground relationship which influence perception are also examined. The "practice" section includes exercises suitable for classroom implementation in sensitivity, nonverbal perception, listening, and awareness.

ED 125 854

Wert, J.
Environment Education Study Projects for College Students
Tennessee Valley Authority, Knoxville
1974 14pp
EDRS price MF $ 0.83 HC $1.67 plus postage

Components - Contains guidelines for conducting environmental projects and a well organized checklist of problem areas and concerns within these.

Status - Guidesheets need to be developed after some of the basic ideas are expanded.

Materials - Depends on specific idea developed.

Mode - Environment, survey, discussion

Context - Ecology, chemistry, physics, botany, zoology, geology

Target - Although intended for college students the approach should work with appropriate modifications in grades 10-12.

Themes - a -
b -
c -
d - population, energy, natural resources, land use, water pollution, water supply, air pollution, transportation

This publication concerns three environmental education study projects designed to help the college instructor, student or group of students in identifying environmental problems at the community level and helping to find solutions to them. It discusses the need for and use of environmental problem solving and includes some factors involved with this method. The projects are concerned with three topics: (1) identifying and lessening the impact of an environmental problem in the community, (2) assessing the impact of a development project, and (3) doing scientific environmental research. Each project discussion included a methods section, questions for consideration and data organization. At the end of the publication is a community survey instrument for determining environmental concerns.

ED 125 868

Wheatley, J. and H. Coon

Teaching Activities in Environmental Education - Volume III
(NIE) ERIC Information Analysis Center for Science Mathematics and
Environmental Education, Columbus
1975 195pp
Center for Science and Mathematics Education, 244 Arps Hall, Columbus,
OH 43210 $4.00
EDRS price MF $0.83 HC $10.03 plus postage

Components - Contains brief descriptions of activities (154) grouped by grade levels. Many, refer to other publications but some description given for all. Addressed to teachers.

Status - All activities need to be developed further and guidesheets prepared.

Materials - Variable depending on activities used and/or developed.

Mode - Demonstration, field trip, survey

Context - Chemistry, physics, psychology, geology, ecology, botany, zoology

Target - Grades K-12

Themes - a - energy, change, system, gradient, cause-effect,
b - measuring, communicating, predicting, observing
c -
d - land use, erosion, energy, conservation, water pollution, air pollution, water supply, noise pollution, solid waste, population, pesticides, decision making

This volume is the third in a series of learning activities designed to supplement a K-12 curriculum. The activities are interdisciplinary in nature and include topics in science, mathematics, social studies, language arts, and fine arts. Besides a division of activities according to grade and subject matter, they are also grouped by environmental concepts that include the biophysical, sociocultural, management, and change; and by problem areas that concern aesthetics, health, genetics, eco-community relationships, and psychological and behavioral considerations. Each activity includes a reference to the environmental education program from which it was taken, as well as a stated purpose and a methods section.

ED 125 885

Energy Conservation, Understanding and Activities for Young People
Federal Energy Administration, Washington
1976   24pp
Superintendent of Documents U.S.G.P.O., Washington, DC 24004
  Stock No. 041-018-00091-7, $0.85
EDRS Price MF $0.83   plus postage

Components - Contains three chapters of reading material plus a glossary and some extremely brief suggestions for activities.

Status - Reading material is classroom ready. Activities would require considerable development before guidesheets could be prepared.

Materials - None except what might be used in activities.

Mode - Reading, survey, discussion, environment

Context - Technology, general, physics

Target - Grades 6-10

Themes - a - energy
b - measuring
c -
d - energy supply, energy conservation

This publication on energy conservation is designed as a resource material for the classroom. It is divided into three chapters concerning a definition of energy, the conservation of energy, and the uses of energy. For each subtopic within the chapters, there is background information and suggested project topics designed for secondary school students. A brief glossary at the end of the booklet defines some of the energy related terms used in the text. A short bibliography and a listing of resource people are included at the end.

Erwin, B.
What Is All This Dam Foolishness?
National Council for Geographic Education (NCGE)
1975 10pp
NCGE Central Office, 115 North Marion St., Oak Park, IL 60301 $0.50
EDRS price MF $0.83 HC $1.67

Components - Contains a set of role descriptions and some "facts" regarding a mythical proposal to build a dam. Assumes that teacher knows how to conduct a role-play simulation.

Status - Individual roles need to be transferred to separate sheets and overall "game roles" determined. Also needs a guidesheet for total class group. Could be adapted to a real local situation.

Materials - None

Mode - Simulation, reading

Context - General, ecology (social studies)

Target - Grades 7-12

Themes - a - system
b - interpreting data
c -
d - decision making, land use, futuristics

This activity is one of a series of 17 teacher-developed instructional activities for geography at the secondary grade level described in SO 009 140. This activity investigates the proposed construction of a dam. It employs a simulation technique in which students debate the conflicts that may evolve between groups with differing goals. To provide background information and to set the scene for the simulation two short newspaper articles discuss crop yield increase due to irrigation and land value increases. A letter to the editor and an article opposing the building of the dam are also included. Eleven roles are presented for various special and nonspecial interest group members of the community who will be affected favorable or adversely by the building of the dam. These include farmers, representatives from a coal burning electric plant and land speculators, and a fisherman. Each role discusses the postion of one person toward building a dam and offers reasons for holding those positions. The issues are debated among the various interest groups and culminate in a special hearing. An environmental impact statement and a fact sheet, describing such things as the cost and advantages of the dam, are presented. A map shows dam construction.

Food, 47 Activities: An Experimental Unit
(USOE) Center for Teaching International Relations, University of Denver
1976 156pp
EDRS price MF $0.83 HC $8.69 plus postage

Components - Components are varied activities (47) which are addressed to teacher. Each includes: introduction, objectives, time required, materials required, and activity description.

Status - Student guidesheets are needed although they should be easy to do since components are well detailed.

Materials - Highly variable from one activity to another. Ranges from nothing to green plants to a projector.

Mode - Discussion, simulation, game, film, survey

Context - Physiology, botany, technology

Target - Grades 7-12

Themes - a - perception, system, quantification, energy
b - interpreting data, inferring
c -
d - food supply, policy formation, technological impact

The activities are in an extremely useful form.

Supplementary teaching activities at the junior and senior-high school level on issues and topics involving food are provided. Topics include food production and distribution, nutrition, food shortages, food habits, and meal planning. Students are encouraged to develop perspective on global food concerns as well as understand their own family nutrition. Some activities are discussion starters and simulation games. Others provide factual data with a focus on thinking skills. Students use charts, conduct surveys, run scientific experiments, and view filmstrips. Where films are required, sources are given for obtaining the materials. Of the 47 activities, six are incomplete because copyrighted materials have been removed from the document.

ED 125 997

Population, 54 Activities: An Experimental Unit
(USOE) Center for Teaching International Relations, University of Denver
1976   182pp
EDRS price $0.83 MF   HC $10.03   plus postage

Components - Components are diversified activities (54) addressed to teachers with considerable detail including objectives and procedures. Some activities are accompanied by student worksheets or reading material. Also contains test material.

Status - Many are classroom ready as the student worksheets are often functional guidesheets. Others need guidesheets to be prepared.

Materials - Usually simple, readily available, or homemade.

Mode - Discussion, simulation, game, environment, data bank, film

Context - Sociology, demography, general, ecology, (mathematics, social studies)

Target - Grades 7-12

Themes - a - population, density, change, model
b - interpreting data, hypothesizing, measuring
c - population, growth
d - population, decision making

This is a very useful resource as activities are interesting, practical to do, and relevant.

Supplementary teaching activities at the junior and senior-high school level on issues and topics involving population factors are provided. Topics include population growth, demography, graphing, population control. Community and national census factors as well as world population are studied. Students are helped to view themselves as individuals in relation to population groups. Certain activities promote decision making between individual preferences and what would be best for society as a whole. Several activities focus on the woman's role and attitudes toward population stabilization and child-bearing. Use of media and community resources is encouraged. Seven of the 54 activities are incomplete because copyrighted materials have been removed from the document.

Resource Unit for Decision Making Skills Including Values Clarification
(USOE) Springfield (Oregon) Public Schools
1974 104pp
EDRS price MF $0.83 (HC not avaialable) plus postage

Components - Contains exercises that can be used with learners to clarify, understand and evaluate the decision making process. Some worksheets are included.

Status - Although the contexts of most exercises are general, there is an opportunity to apply to a specific science related problem.

Materials - None

Mode - Problem solving, simulation, discussion

Context - General, technology

Target - Grades 8-12

Themes - a -
b -
c -
d - technological impact, decision making

The document presents teacher developed ideas for helping students gain skills in the process of decision making through individual and/or group activities. Individual activities are: (1) your own values, (2) case studies on honesty, (3) skills in helping others understand you as a person, (4) anxiety about future or conflict with parental wishes for future, (5) "T" diagram, (6) improving self concept, (7) overcoming apathy, (8) conforming to the standards of others, (9) involvement and (10) broadening options and the decision making base. Group activities for developing and improving decision making skills focus on the following areas: (1) group decisions, (2) group consensus by problem statement, (3) group agreements, and (4) decision by consensus - six exercises on group decision making which focus on personal expectations, group trust, behavior description, relationship between feelings and behavior, communication skills, and the identification of factors which prevent a person from giving and receiving help from others. Forms for evaluating the decision making activities and a group guidance staff survey after inservice are presented. A 12 page list of resources is included. Some thoughts about the Oregon State University values seminar are presented as well as three additional activities and suggestions for implementation.

ED 127 134

Fouch, D.
Activities in Elementary Probability
Michigan Council of Teachers of Mathematics (MCTM)
1975 53pp
MCTM, Box 16124, Lansing, MI 48901 $1.00
EDRS price MF $0.83 HC 3.50 plus postage

Components - Contains a group of lessons (11) addressed to teacher but usable by learners. Includes "experiments" (17) which are mainly confirmation exercises.

Status - Some of the job cards are classroom ready although preparing guidesheets will be worth the effort.

Materials - Relatively simple and easily available.

Mode - Problem solving, laboratory, reading

Context - Technology, general (mathematics)

Target - Grades 6-12

Themes - a - probability
b - interpreting data, controlling variables
c -
d - consumerism

This monograph on elementary probability for middle school, junior high, or high school consumer mathematics students is divided into two parts. Part one emphasizes lessons which cover the fundamental counting principle, permutations, and combinations. The 5 lessons of part I indicate the objectives. examples. methods. application, and problems for each concept. Part two consists of a combination of 6 lessons and 17 experiments which deal with probability and its applications. The experiments are organized in such a way that they can be converted into task cards. Answers are given for the 47 problems of the entire unit.

ED 127 144

Draper, B.
Metric Activities - Grades K-6
San Diego (California) City Schools
1975 43pp
EDRS price MF $0.83 HC $2.06

Components - Contains twelve activities or groups of activities plus some reference material. Some materials addressed to learners and others to teachers.

Status - Most student worksheets are ready to use.

Materials - Meter stick, paper, and other simple readily available materials. A few special things need advance preparation.

Mode - Laboratory, problem solving

Context - Anthropology (mathematics)

Target - Grades K-6

Themes - a -
b - measuring
c - people, population
d -

This pamphlet presents worksheets for use in fifteen activities or groups of activities designed for teaching the metric system to children in grades K through 6. The approach taken in several of the activities is one of conversion between metric and English units. The majority of the activities concern length, area, volume, and capacity. A bulletim board idea for introducing the Celsius scale is included. In addition to the worksheets, the pamphlet includes a brief history of the metric system and rationale for the United States' adoption of it and a list of materials and audio-visual aids available to teachers in the San Diego City Schools.